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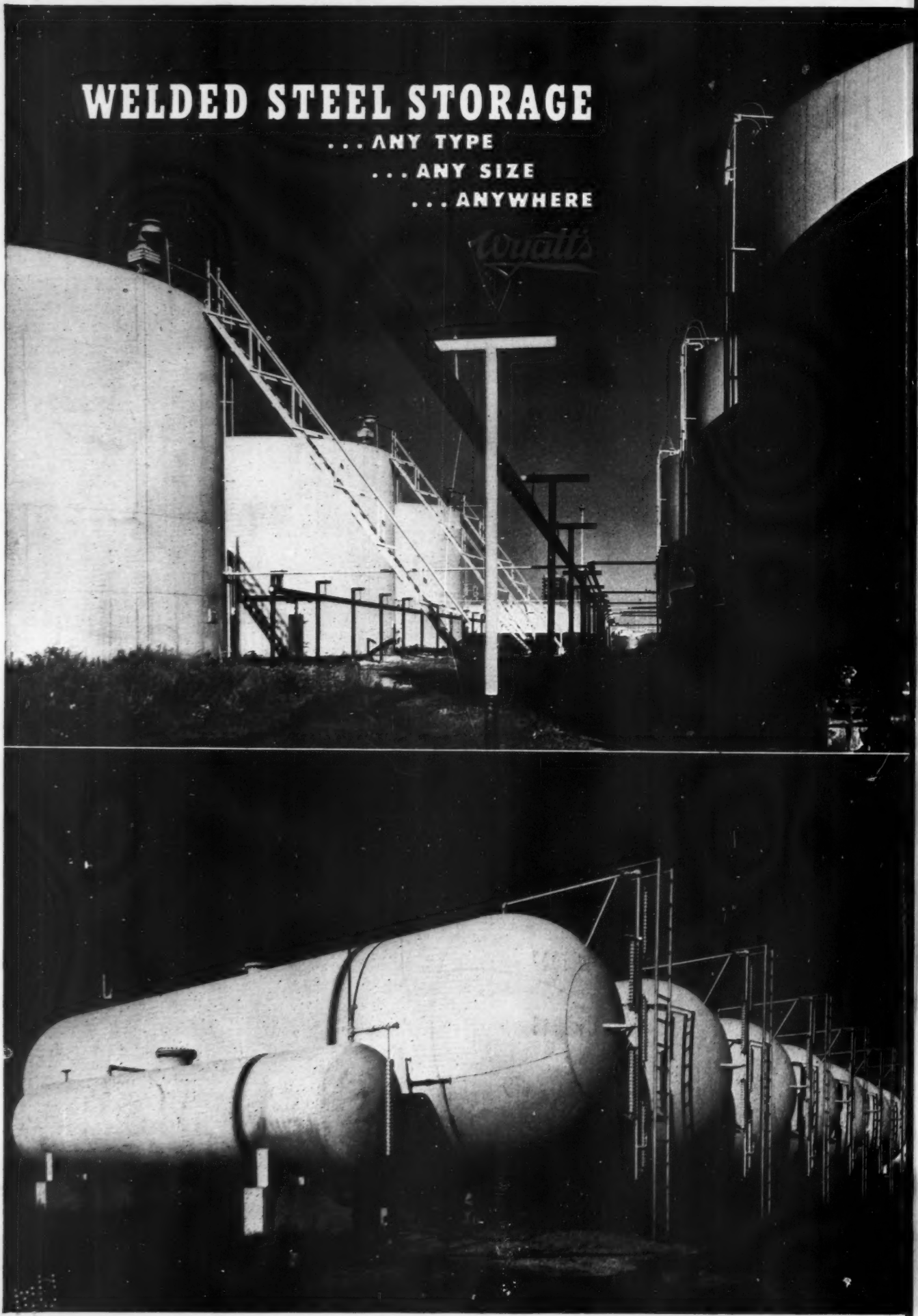
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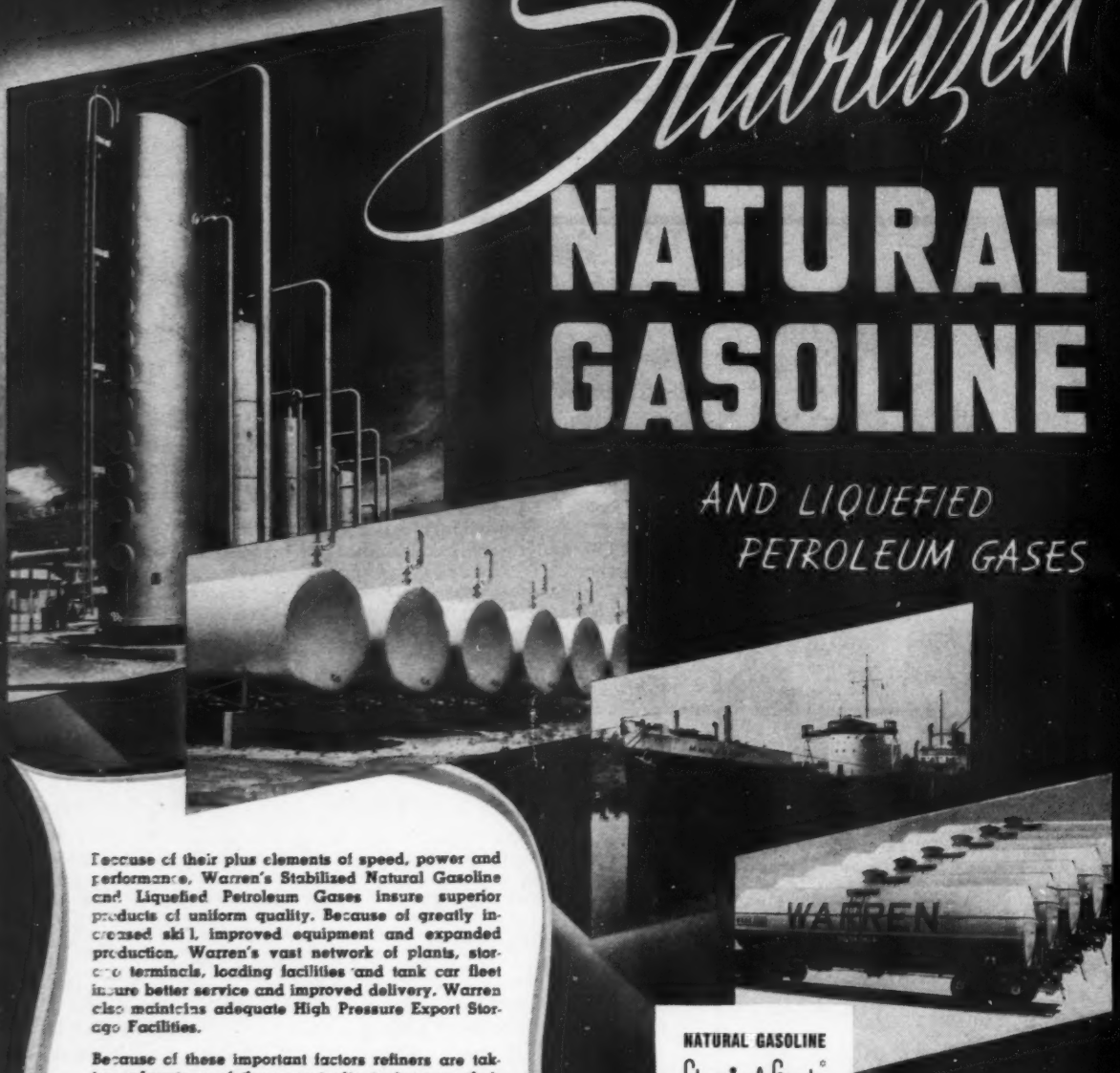

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THE OIL AND GAS JOURNAL

No Runaway Market

A WEEK ago we prepared this page assuming that a committee-approved OPA-extension bill would be passed by Congress with petroleum controls lifted by July 1. The discussion went to the wastebasket when last-minute compromises of a revised bill provided for a continuance of oil-price control. The bill finally passed received a presidential veto, OPA no longer exists, and we are about where we thought we would be a week ago so far as petroleum is concerned. Unfortunately the future is as uncertain as it ever was, reflecting a lack of a coordinated legislative and administrative postwar program and leadership at Washington.

Without attempting to prophesy what will happen over the next few days, we are hopeful that any new legislation will recognize that price controls are not needed in this industry. The legislative committees have complete information pertinent to this matter.

No runaway market in petroleum products is in the offing. Friends of the industry at the nation's capital have been seeking to free operators from price controls because they knew that the oil industry has sufficient supplies to meet current and future demands. Indicative of the verity of this contention is the fact that both domestic and foreign production now exceed the war peaks of last August.

There is no secrecy about tne price position of crude-oil producers. Acting in an advisory capacity to OPA and in other investigations, they have presented data reflecting increased operating costs in all phases of their activities. While replacement costs, which in the final analysis must determine price trends are much greater the advisory group early this year recommended a 35-cent-per-barrel initial increase in posted schedules. OPA, which never challenged the accuracy of any of the industry's conclusions, finally granted a 10-cent increase, the first general advance since 1938.

With this background, increased prices for crude oil with advances in products which reflect both the higher levels for charging stock and the greater manufacturing costs are mandatory. As to products, adjustments in the present price relationships by areas are certain to follow a return to competitive marketing operations after 5½ years of ceilings and tardy emergency price relief from OPA.

Excesses and deficiencies in supplies since the close of the war have been the inevitable result of government controls. Normally there are constant shifts in prices at refineries, reflecting basic conditions having to do with manufacturing costs and seasonal and permanent changes in demands. Just what these price adjustments will be with a return to open markets no one can predict but there is no reason to fear that all markets cannot be supplied in full at reasonable prices.

Price-Control Issue Hangs in Balance as Solons Ponder

by Henry D. Ralph

WASHINGTON. — The future of price controls on petroleum, as on everything else, hung in the balance this week as Congress debated whether or not to revive Office of Price Administration for a temporary period following its death Sunday night.

All federal price controls ended at midnight, June 30, following the action of the House on Saturday in upholding the President's veto of legislation to continue it in modified form, but workings of a free market were not felt immediately because of the proposal to revive OPA until July 20 and reinstate all old ceilings and regulations pending the enactment of a more permanent law.

The revival resolution passed by the House Monday would reinstate the old law retroactively to June 30 except that no prosecutions could be brought for actions between June 30 and the date of enactment of the resolution. This implies that OPA would immediately put its old oil-price ceilings back into effect but there would be no penalty for sales above ceiling prices during these first few days of July.

Senate rules prevented immediate consideration of this resolution, and it appeared that final action might be delayed until after the July 4 holiday.

No Complaints on Oil

While Congress was being deluged with complaints of rapidly rising rents and prices, no reports reached Washington of increases in prices of crude oil or petroleum products, and it was presumed that widespread adjustments would be delayed until the legislative situation clarifies.

Whether Congress can draft a satisfactory revision of price-control laws within the next 2 weeks is problematical, since it spent 4 months on the bill the President vetoed. Congressional opinion is that there is no chance for continuing the old law for another year without change, and the general prediction is that any amendments will be less acceptable to the President than the bill he vetoed.

Truman asked that the new bill give more discretion to the administration in decontrol but did not object to general language establishing a policy of gradually dropping controls over commodities no longer in short supply. He specifically opposed the legislation of detailed standards which would require the lifting of ceilings during the next 6 months where serious price increases would result. He also endorsed provisions to require increases in price ceilings where necessary to increase production, but said this is not necessary as the administration would do this anyway.

A new law along the lines requested by the President probably would result in the decontrol of petroleum if properly administered, but the present temper of Congress is that more detailed and specific formulas must be enacted if decontrol is to be accomplished.

Chance Seen Stripper Subsidy May Continue Without Break

WASHINGTON.—The stripper-well premium-price subsidy ended at midnight June 30, but the situation was such that it might be continued without a break.

The subsidy was paid by Reconstruction Finance Corp. but under Office of Price Administration regulations. With the death of OPA Sunday night RFC no longer had authority to continue making the payments. However, a recent appropriation bill permits RFC to make payments for subsidy obligations incurred during the fiscal year which ended June 30, so crude purchasers are assured of reimbursement for the premium prices they paid on stripper-well production during June.

The resolution to revive the old OPA law until July 20, passed by the House Monday and now pending in the Senate, provides that subsidy programs are to continue without change between July 1 and July 20. If this becomes law the stripper-well subsidy would continue until that date, by which time Congress is expected to enact more permanent legislation. Since subsidy payments are billed by purchasers only after the end of a calendar month, a lapse of a few days in OPA authority need make no difference.

The subsidy is based on OPA ceiling prices, and there are no such at the moment, so purchasers may post any price they desire for crude. Assuming that the revived OPA would immediately reinstate the former crude ceilings, this is the situation: Producers may demand and purchasers may pay more than the ceiling during the period of no OPA without danger of prosecution: Purchasers may continue paying June prices including the premium in the expectation that a new law and new regulations will reinstate the old provisions and they will be compensated for the premium through a revived subsidy: They may pay less than the June prices paid stripper production, in which case their subsidy payments, if revived would be reduced proportionately.

The bill vetoed by the President provided that the stripper-well subsidy could be continued, whether or not ceilings were retained on crude prices, until April 1, and presumably a similar provision would be included in a bill to continue OPA beyond July 20.

Bareco Oil Stock Reduction Proposed to Stockholders

A meeting of stockholders of Bareco Oil Co. has been called for July 31 in Tulsa to take action on a proposal by the board of directors to reduce the par value of outstanding stock to $1 per share and distribute $4 per share to the stockholders.

The move will be a partial distribution of capital and not earnings. O. L. Cordell, president of the company, explained that the action will have no effect on present operations consisting of refineries at Barnsdall, Okla., and Wichita, Kans., and pipe line and marketing facilities.

Barite Output Sufficient

WASHINGTON.—Barite, used as a weighting material in drilling operations, is now being produced in the United States in sufficient quantities to meet major domestic requirements, according to the Bureau of Mines. In a survey of mining and marketing of the mineral, the bureau noted the leading position in the prewar barite market was held by Germany but said United States production the last several years has greatly exceeded the German barite output.

THIS 1946 S M T W T F S WEEK

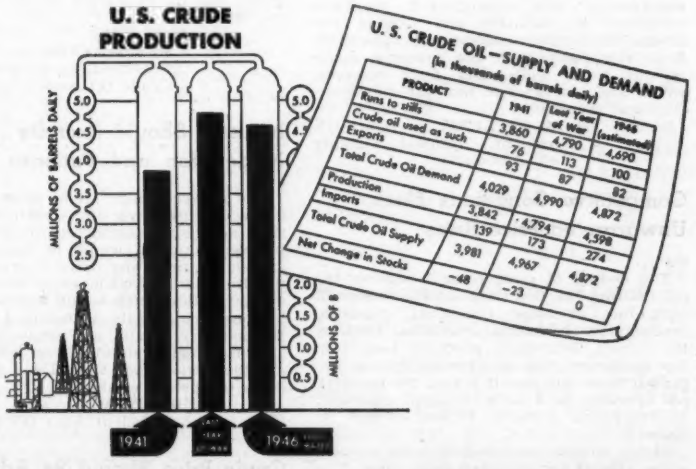
PRICES—Long-sought freedom from price controls came suddenly this week but uncertainty over the possibility of reinstatement checks immediate action. . . . Products prices hold steady at ceiling levels. . . . First over-ceiling break expected in crude prices if no new legislation is enacted. . . . ¶House passes OPA extension resolution but prospects of Senate approval considered dim. . . . House measure provides retroactive extension of old law but bans prosecutions for pricing actions between June 30 and date of passage. . . . ¶Stripper-well subsidy dies with OPA. . . . Payments to continue on production through June 30 but future, like that of OPA to which it is linked, depends on legislation. . . . ¶Industry leaders say public need fear no inflation in oil prices but necessary adjustments will stimulate exploration. . . .

PRODUCTION—Well completions last week hit highest figure since week following Pearl Harbor. . . . Total counted at 608 in The Oil and Gas Journal's tabulation, compared to 637 in the week ended December 13, 1941. . . . High during the war was 596 in the week ended July 28, 1945. . . . ¶Crude production drops 14,060 bbl. to total of 4,940,790 bbl. daily (exclusive of 26,200 bbl. daily of condensate). . . . Kansas, down 17,150 bbl. daily, responsible for decline. . . . ¶Bureau of Mines reported preparing revision to crude and products demand forecast raising second-quarter estimates by 2 per cent. . . .

REFINING—CPA disclaims any plan to ban steel for refinery construction. . . . Agency's priorities diverting steel to harvesting machinery, military construction, and housing. . . . Mills 3 months behind on orders, but production rising rapidly. . . . ¶First commercial production of glycerin epichlorohydrin scheduled to begin soon in Shell's new Houston plant. . . . Second new Shell plant in Houston will boost company's output of isopropyl alcohol by 100,000,000 lb. annually. . . . ¶Houdry Process Corp. leases synthetic cracking catalyst plant at Paulsboro, N. J., for 1 year. . . . Company to determine during period if manufacture of catalyst feasible. . . .

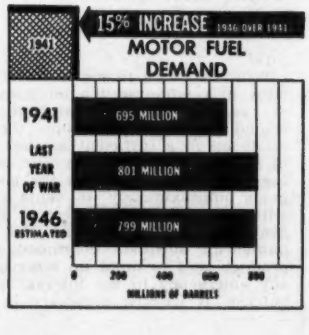
REGULATION—Oklahoma, Kansas, and Louisiana boost July allowables. . . . Kansas total set at 270,000 bbl. daily; Oklahoma at 385,545 bbl. daily. . . . July allowable in Louisiana fixed at record high of 428,641 bbl. daily. . . . ¶Appointment of organization committee to plan permanent setup for National Petroleum Council delayed pending transcript of June 21 meeting. . . . Congress trims funds for the Oil and Gas Division from $449,516 to even $400,000. . . .

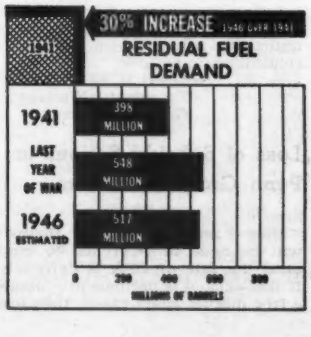
NATURAL GAS—Coal and coke industry representatives lay their case against natural-gas expansion before Federal Power Commission in Washington hearing. . . . Assert natural gas should be prevented from being "dumped" at low prices in areas now dependent on other fuels, particularly for industrial uses. . . . ¶Cities Service Gas discloses plans to build 64 miles of 12-in. line to increase capacity for taking gas from West Edmond, Oklahoma, field, to 60,500,000 cu. ft. daily. . . . ¶Louisiana Legislature votes resolution asking "substantial increase" in well-head price of natural gas throughout the Southwest. . . .



U. S. CRUDE OIL—SUPPLY AND DEMAND
(In thousands of barrels daily)

PRODUCT	1941	Last Year of War	1946 (estimated)
Runs to stills	3,860	4,790	4,690
Crude oil used as such	76	113	100
Exports	93	87	82
Total Crude Oil Demand	4,029	4,990	4,872
Production	3,842	4,794	4,598
Imports	139	173	274
Total Crude Oil Supply	3,981	4,967	4,872
Net Change in Stocks	−48	−23	0





These illustrations emphasize the predictions made by Warren A. Sinsheimer, vice president of Petroleum Advisers, Inc., a Cities Service Co. subsidiary coordinating petroleum operations. Sinsheimer forecast 1946 production will approximate 4,600,000 bbl. daily, that gasoline demand for the year will be 15 per cent over 1941, and heavy fuel and distillate oil demand 30 per cent over the last prewar year. He gave three reasons why demand is upsetting predictions made by many economists last autumn: 1, despite strikes, industrial demand is holding up remarkably well; 2, military consumption is higher than estimated; 3, "unbelievable mileage" is being extracted from the nation's war-weary automobiles. "Price controls were originally set up on the assumption that the industry was operating on purely a gasoline economy, so to speak—as, in fact, it was at the time," Sinsheimer said. "Since 1941, however, the relationship in refinery product yields has changed to meet the growing demand for fuel oils. It appears that this relationship will continue through 1946 and probably longer. . . ."

What Others Say

The swift and unexpected end of government price control this week following President Truman's veto of the extension legislation brought to the oil industry the decontrol it has been demanding for months. Though the situation was confused by possibility of new legislation, representative leaders of the industry gave their views on the development, probable price trends, and the resulting future outlook. Their expressions are presented here by The Oil and Gas Journal.

Definitive Termination Best For Consumers, Public, and Industry

Sirs:

The Texas Co. has publicly stated several times in recent years that current crude-oil prices fixed by OPA were not in keeping with the increased cost of finding and producing oil and that a more equitable price is necessary to stimulate exploratory drilling. It is our opinion that a definitive termination of price control legislation affecting the petroleum industry which would permit the free interplay of competitive forces would be in the best interests of the consumers, the public and the industry.

The contention that governmental price control is requisite in times of peace to the wellbeing of our economy is foreign to fundamental and far-reaching American concepts.

However, pending clarification of the price control legislation situation in Washington, we believe it would be inadvisable for the petroleum industry to increase its crude or product prices. This is essential, in our opinion, not only to avoid public criticism, but also the possible enactment of punitive price legislation against industry.

HARRY T. KLEIN,
President, The Texas Co.

Preservation of Small Wells Depends on Crude Prices

Sirs:

A 1945 national survey shows average cost of 4 cents per gallon to find, develop, and produce crude oil. The present-day average cost is much higher. Therefore, the oil industry must have at least 5 cents per gallon, with commensurate increases in products to insure continuance of the exploration, and development programs necessary to maintain and expand our production under conservation practices. Even this figure will not preserve many of our small wells, and their reserves, which are beneficial to our national economy and security.

H. M. McCLURE,
President, National Stripper Well Association.

Competitive Conditions Block Unwarranted Price Rises

Sirs:

The ending of price control restores the oil industry to the status under which it heretofore produced constantly improved products in increasing quantities. Look at the record. Petroleum products have cost the consumer less as processes have improved them. For nearly a year the industry has operated on a ratio of supply equalling or exceeding demand. It has earned its spurs.

Highly competitive conditions are a guarantee against unwarranted price rises. The industry is an example of free enterprise in action. Its customers have had, and may anticipate prices which will be fair and conditioned upon cost.

RALPH B. LLOYD,
President, Western Oil and Gas Association.

Loss of Subsidy Serious to Penn Grade Producers

Sirs:

Most Eastern producers realize nothing will be done in reference to crude prices until the fate of OPA is definitely settled. If this agency is permanently abolished and a free market again exists, then loss of subsidy will be seriously felt by all Pennsylvania Grade producers.

An increase in the basic crude prices will be necessary to offset this difference. We have reason to believe that the refiners of Pennsylvania Grade crude will pay the producers whatever market conditions warrant. Our interests are mutual, and neither group will try to prosper at the expense of the other.

D. T. RING,
Preston Oil Co.,
President, Pennsylvania Grade Crude Oil Association.

Industry Should Exercise Moderation and Patience

Sirs:

The general public seems to be almost as badly confused over the situation with the OPA as are the authorities in Washington. In my opinion it would be hazardous for anyone to make any definite predictions at this time, but the oil industry has not asked for any relief which would impose substantial burdens upon its customers. I think that the industry should and undoubtedly will exercise great moderation and patience during the period that will elapse before definite trends are established.

HENRY M. DAWES,
President, Pure Oil Co.

Crude Price Should Be Advanced To Cover Additional Costs

Sirs:

With reference to the termination of the OPA in relation to the oil industry, it is my considered opinion that the industry should immediately advance the price of crude oil in a sufficient amount to absorb in full the added development and operating costs incurred during the last 4 years, being approximately 40 cents per barrel with compensating increases in product prices. In order to assure the American public an adequate continued supply of products and to build up reserves to meet any emergency in the interest of national defense, it will be necessary in the near future to advance prices for crude oil sufficiently to include replacement or finding cost. These conclusions are based on the factual study made by the National Crude Oil Industry Advisory Committee in cooperation with the OPA.

CHARLES F. ROESER,
Independent producer,
Fort Worth, Tex.,
Chairman, National Crude Oil Industry Advisory Committee.

Death of OPA Allows Return To Normal Peacetime Basis

Sirs:

The unyielding attitude of OPA has made it impossible for the oil industry to function efficiently since the outbreak of World War II. New discoveries have not kept pace with consumption. Serious dislocations in the refining and marketing of products have occurred as a result of inept regulations.

With the death of OPA the industry will again be able to go forward on a normal peacetime basis. An adequate price for crude oil will stimulate the drilling of wildcat wells with the result that new reserves will be discovered. Price increases to compensate for the increased costs of deeper drilling, labor, and materials are inevitable. However, these increases must necessarily be moderate because of the competitive nature of the industry.

GILBERT J. MUELLER,
Vice president, Argo Oil Corp.

Bowles, Porter Actions Raise Distrust as to Sincerity

Sirs:

The persistent refusal of Economic Stabilizer Bowles and Administrator Porter to decontrol commodities which are in full supply, such as petroleum, has created distrust and doubt in the public mind and on the part of Congress as to their sincerity. They have sought to substitute propaganda for performance. Petroleum should have been decontrolled immediately after V-J Day. If controls are removed, I think that the price of petroleum and its products should and will increase to a level which will absorb increased costs, such as labor and materials, which were thrust upon the industry through no fault of its own.

B. A. HARDEY,
President, Independent Petroleum Association of America.

Higher Crude Prices Necessary; Subsidy Should Be Continued

Sirs:

I believe that whether or not OPA is reinstated, crude oil and refined products prices will have to be increased to cover higher costs of all kinds. Believe also that stripper-well subsidy should not be eliminated at this time because such wells cannot be operated for the prices which may be sufficient for flush or prorated wells.

M. A. ARVIN,
President, Kentucky Oil and Gas Association.

Public Need Fear No Inflationary Oil Prices

Sirs:

The unexpected end of OPA controls, including those over oil and oil products prices, need cause no alarm on the part of the consuming public as to inflation in

(Continued on page 62)

Coal and Coke Spokesmen Are Vague at FPC Hearing

WASHINGTON. — Coal, coke, and manufactured gas industry spokesmen were on the stand all last week in the natural gas investigation of the Federal Power Commission, and are being followed this week by representatives of railroads and labor organizations.

Although the coal and coke experts submitted voluminous exhibits relating to the status of their industries and predicted dire economic consequences if they are entirely supplanted by natural gas, they were not very specific in what they wanted FPC to do. Their general complaint was that something should prevent natural gas from being "dumped" at low prices in areas now chiefly dependent on other fuels, particularly for industrial uses.

They spoke rather vaguely about conservation of gas and retaining it for use in the Southwestern states where it is found, and endorsed the idea that the FPC should control "end use," by which they seemed to mean that natural gas might be piped long distances for household use but should not be used for industrial purposes. They did not specifically request that the commission deny all future applications for interstate natural gas transmission pipe lines, although they cited many figures to show that employment and municipal tax values would drop if natural gas forced the closing of manufactured gas and coke plants and displaced the use of coal.

Koppers Co. Testimony

Lengthy presentations made by officials of the Koppers Co. stressed the importance of the merchant coke plant, which depends on the local sale of manufactured gas but which also produces coke and by-product coal tar and derivatives, all of which have wide uses and are in great demand by many industries.

One of these witnesses was Alfred R. Powell, research director for Koppers, who took exception to the technical presentation made the week before by P. C. Keith of Hydrocarbon Research, Inc. Keith had predicted that within a few years it will be economically feasible to gasify coal at the mines and pipe the gas long distances in competition with all other fuels, including natural gas. Powell did not dispute the technology of the processes outlined by Keith but doubted that they would ever become economic from a cost standpoint. Under questioning he admitted that Koppers has done little or no direct research in this field and that the chief activity of its research department is to study the work done by others.

W. F. Ehmann, manager, Wisconsin Coal Bureau, Inc., presented an exhibit which he said was designed to show that the use of natural gas by industry results in no substantial economy as to the cost of fuel; that the use of coal in the Great Lakes area has been diminishing and the use of competing fuels increasing during the recent past; that no substantial industrial increase has resulted from the introduction of natural gas in areas of that region where it is being used.

Basis of Opposition

On cross-examination, attention was called to one of the tables in Ehmann's exhibit in which he had sought to show that in areas in which natural gas is used by industry, the cost of fuel as related to the value of products produced is higher than in areas where natural gas is not available industrially. Counsel for the Natural Gas Industry Committee pointed out the fact that coal and other opponents of natural gas expansion largely base their opposition on grounds natural gas is sold to industry at too low a rate.

John Maher, of the Maher Coal Bureau, conceded many people want natural gas but felt the desires of consumers should be subjugated for what is best for the national economy as a whole. He also asserted that he did not believe the people of Wisconsin should be allowed to determine what use they should make of natural gas if it were to be brought into that state. He said he thought FPC should control end use but could not offer any suggestions as to how far they should go in determining what is a proper or improper use.

Norman F. Patton, of the statistical division, Anthracite Institute, presented an exhibit showing the amount of coal produced over the past several years and the average cost. He said that labor costs amount to over 70 per cent of the cost of production, and contended when natural gas is introduced into an area the volume of anthracite sales is substantially reduced, and that the industry also has to compete with oil, manufactured gas, wood, and imported anthracite.

J. L. Orchard, retail coal dealer, London, Ont., testified that natural gas was brought into London in 1935 from Dawn field in Canada, and that within 4 years the sales of his company were cut in half. He said that in 1942 the depletion of this field seriously curtailed natural gas service there and as a result there was ill will among the gas customers.

Upon cross-examination, Orchard admitted Dawn field was quite small; that the Canadian Government, shortly after the outbreak of the European war, compelled the gas company to give priority to industrial customers of gas over domestic customers and that there was much industrial activity in the London area, as well as the shortage of coal in the war years.

Former Customers Want Gas

The fact was also brought out that by recent arrangement the gas company serving the London and Canadian area is to get natural gas from the United States and that former gas customers are again anxious to have gas service.

W. R. Morris, vice president, Seaboard Division, Koppers Co., who had presented data on the economic loss of byproduct coke-oven plants, upon cross-examination stated that most of these plants are about 25 years old, and then admitted that the average life of coke ovens is about 25 years, so that if they were forced to close down the investment loss would be small.

It also developed that some of the coke plants were installed in areas after natural gas had already begun to be distributed and that natural gas and coke gas competed in these areas. Further questioning showed that the byproduct coke industry, which uses bituminous coal as raw material, had often seriously curtailed markets for anthracite coal.

New Tax Goes Into Effect On Mississippi Transfers

JACKSON, Miss.—A new law requiring a mineral stamp for transfers and filings of oil and gas and mineral rights as well as mineral reservations and royalties has gone into effect in Mississippi.

The stamp will be issued in convenient denominations and will be used in a manner similar to the present federal tax stamp on property transfers, said Burt J. Barnett, state auditor. The stamps were provided in a law passed by the recent legislature. The tax scale is 3 cents an acre for periods of 10 years or less, 6 cents an acre for more than 10 years and under 20 years, and 8 cents an acre for periods of more than 20 years.

International

WORLD-WIDE OIL DEVELOPMENTS

Creole's May Production Up 10,000 Bbl.

NEW YORK.—Creole Petroleum Corp.'s Venezuelan crude output and refinery runs both showed an increase of more than 10,000 bbl. daily in May as compared with April operations.

Crude production for May was 554,513 bbl. daily compared with 543,689 bbl. daily in April. Of the 554,513 figure, 400,629 bbl. came from the Lake Maracaibo area and the remaining 153,884 bbl. from eastern and other areas, including Cumarebo. Crude output for May 1945 was 458,618 bbl. daily.

Daily refinery runs in May were 65,459 bbl. compared with April daily total of 52,251 bbl. Of the total crude refined in May, 42,414 bbl. daily was put through at the Caripito refinery and the remaining 9,837 bbl. daily at La Salina.

In May, 14 oil wells were brought in with no gas wells and 3 dry holes. The fields where these wells came in, their average initial production and average depth follow:

Jusepin: 7, 456 bbl., 5,468 ft.; Bolivar Coastal (B.C.F.): 3, 440 bbl., 5,092 ft.; Mulata: 3, 211 bbl., 5,989 ft.; and San Joaquin: 1, 270 bbl., 4,863 ft.

Egypt Seeks to Continue Cairo Pipe Line Operation

CAIRO.—If the British military authorities agree to operate the 75-mile pipe line from Suez to Cairo on a nonprofit basis, Egypt's minister of communications has suggested that this wartime means of transportation be continued.

This line was built and completed in January 1944, on behalf of the British Army, by Shell Co. of Egypt, using U. S. lend-lease equipment in part. It is a 6-in. line with a 7,000-bbl. daily capacity. In effect, it is an elongated loading rack of the Anglo-Egyptian Oilfields, Ltd. (Shell) Suez refinery to the principal petroleum center of Egypt.

Egypt's minister of communications has also suggested that a committee be formed to study government construction of a new pipe line "when the existing one because unserviceable."

Meanwhile, it is reported that the Egyptian Government plans to enlarge its own relatively small Suez refinery which operates on royalty crude from Anglo-Egyptian. This project has been delayed pending some decision on the terminus of the Trans-Arabian pipe line, which Egyptian officials hope will be somewhere on Egypt's Mediterranean shores. (The Oil and Gas Journal, June 29, page 62).

Nigerian Exploration Due

LONDON.—Exploratory operations in West Africa's Nigeria are expected to get under way shortly. The 2-year license granted to holders in 1945 had been suspended until 1947, owing to war conditions. To date, Trinidad is the only British colony with substantial oil production.

French Plants Seeking North Texas Crude

NEW YORK.—French refinery interests are currently endeavoring to complete negotiations for approximately 500,000 bbl. of North Texas crude for use in four or five refineries in France which are so designed as to preclude the use of Middle East crude with its higher sulfur content.

French interests reportedly are so anxious to get North Texas crude that a premium of 35 cents per barrel was being offered—contingent, of course, upon the removal of OPA price controls.

Due to the question of dollar exchange involved, the French Government has been carrying on crude purchasing negotiations but recently authorized some of the refinery interests to deal directly with the producer. Among the companies which fall in this category are Compagnie Francaise de Raffinage, Standard

The Colombian Petroleum Co. (The Texas Co. and Socony-Vacuum Oil Co., Inc.) owner and operator of the Barco concession in eastern Colombia, recently was confronted with an emergency cutting and fishing job at one of its drilling wells at Camp Tibu. The company chartered a Trans-Caribbean Airways DC-3 and flew tools and an operator supplied by Houston Oil Field Material Co., Inc., from the United States to Cucuta, Colombia, where they were transported by company plane to the field location. View shows tools and equipment being loaded in DC-3

Francaise des Petroles (Standard of New Jersey), and Refinie de Berre, a private French refinery.

While the majority of French refineries operate on Middle Eastern crude, large prewar crude purchases were made in Colombia and Venezuela. Recently, Colombian shipments were resumed, but not in quantities sufficient to supply demands.

Tarakan Output Due to Hit 75 Per Cent Prewar Total

WASHINGTON. — Restoration of Borneo's oil industry is moving at such an encouraging pace that production at Tarakan is expected to reach 75 per cent of prewar output by year's end.

The bureau of foreign and domestic commerce of the Department of Commerce here said its reports show Tarakan's production is now above 600 tons (about 4,200 bbl.) daily. Most of Tarakan's fields and nearly all storage tanks and buildings were destroyed at the time Tarakan was liberated in May 1945. Prewar production was about 2,000 tons (14,000 bbl.) daily.

Good progress in restoration activities at Balikpapan also is reported. Here annual prewar production was about 1,000,000 tons (7,000,000 bbl.) All pipe lines and tanks were destroyed, and early resumption of operations was not possible, the bureau said.

The Seria fields in British North Borneo which had an annual prewar output of 700,000 tons (about 4,900,000 bbl.) and the refinery at Lutong are expected to be working at full capacity in 1947. Because of the destruction in the Miri fields in Sarawak, further investigation is necessary to determine if rehabilitation is financially feasible, the bureau reported. Annual prewar production was 200,000 tons (about 1,400,000 bbl.)

Equipment Imports Listed

BOGOTA. — A total of $1,675,000 worth of oil equipment was imported here during the first 10 days of June. The total of such imports since January 1 to May 31 amount to $10,346,000.

British Ration to Continue

LONDON. — No increase in England's basic petroleum ration can be expected at present, because every gallon currently consumed must be paid for in dollars, according to the Ministry of Fuel's parliamentary secretary. Furthermore, he said that during the first 2 months of this year, 7,000,000 bbl. of gasoline had been imported and that 46 per cent of this was purchased with dollar exchange.

Northern Mexico's April Output Up 18 Per Cent

WASHINGTON.—Production in Mexico's three northern fields of Poza Rica, Naranjos, and Panuco in April gained 18 per cent over March, according to reports to the bureau of foreign and domestic commerce in the Department of Commerce.

Output from the three fields in April averaged 131,505 bbl. daily. The figure represented an increase of 34 per cent over the average for January. Total April production was 3,945,176 bbl. against 3,455,021 bbl. in March. Stocks in the fields and at terminals in the northern zone totaled 3,304,273 bbl. April 29 compared with 3,524,266 bbl. March 29.

Chile Plans Control

SANTIAGO.—The development of Chile's oil industry will continue to be carried on entirely under government supervision, according to a recent statement from the head of Corporacion de Fomento de la Produccion. However, foreign geologists, engineers, and drillers, particularly from the United States, have been employed by Fomento.

Panama's Imports Rise

WASHINGTON.—Gasoline imports into Panama for the first quarter, 1946, totaled 2,878,210 gal., according to the Bureau of Foreign and Domestic Commerce. Monthly imports were: March, 912,230 gal.; February, 962,640 gal.; and January, 1,003,340 gal.

Pemex Workers Strike

MEXICO CITY.—Another 24-hour strike of Mexican oil workers occurred last week. Union officials said all Pemex employes in the country walked out to emphasize their demand for equalization of wages in certain categories.

Penang Becomes Free Port

SINGAPORE. — Penang became a free port June 1, and only petroleum, liquor, and tobacco are now subject to duty. There are no export taxes as this is paid on products before they leave the mainland for reexport from Penang.

Dutch Production Small

THE HAGUE. — Production from the relatively small field near Coevorden, in eastern Holland, discovered by the Nazis during the war, is expected to total about 800 tons (5,600 bbl.) daily. This would approximate about one-fifth of Holland's annual needs. Pre-war production here was less than 400 bbl. daily.

International

California Standard Arranges Credit

SAN FRANCISCO. — Standard Oil Co. of California has completed banking arrangements for a $75,000,000 credit to be used "with the expansion of the company's domestic and foreign activities." Twenty-nine banks will participate.

Mexican Negotiations Unsettled

LONDON. — Negotiations between Mexican Eagle Oil Co., Ltd. (Shell) and the Mexican Government, regarding expropriations payments, remain unsettled. Shell interests reportedly declined to agree on the proposed financial settlement terms.

May Output Listed

NEW YORK. — Oil production by Trinidad Leaseholds (New York) Inc., from its own fields only during May was 481,046 bbl., a daily average of 15,518 bbl.

Colombia's Production Up

BOGOTA.—Colombia's crude production for the first quarter of this year totaled 5,667,000 bbl., almost 1,000,000 bbl. more than in the same period of 1945, according to statistics released here.

Dutch Company Orders Tugs

THE HAGUE. — Bataafsche Petroleum Maatschappij reportedly has placed orders for two sea-going tugs and four river tugs to be used in the Netherlands East Indies and in New Guinea.

Egypt's Imports Listed

Egypt's total imports during 1945 amounted to $246,983,180, according to the United States Department of Commerce. Of this amount, gasoline accounted for $5,138,237; and kerosene, $13,263,124.

Cyprus Survey Scheduled

NICOSIA, Cyprus.—Petroleum Development (Cyprus) Co., Ltd., recently sent American and British geologists here to complete a geophysical survey. Before the war, a geological ground reconnaissance crew reported the possibility of workable reserves on this island. The Cyprus company is an affiliate of Iraq Petroleum Co., Ltd.

Oil well in the Yabase district, near Akita, Japan

International
WORLD-WIDE OIL DEVELOPMENTS

Far Eastern Oil Picture Clarifying; Numerous Changes Under Way

by Warren W. Burns

This is the first of a two-part discussion of the restoration of oil's peacetime role in the Far East. The second part will be published in next week's issue.

NEW YORK.—Oil's peacetime role in the Pacific Ocean areas is gradually but extremely slowly coming back into focus. The reasons for the disturbances are many, with the war accounting for the majority of the economic and political upheavals. When the full view is clearly defined, the observer will probably note numerous changes.

The current and projected oil activities in the Philippines, China, and Japan are dealt with at length in this article. However, the situation in each of these three countries can be summed up as follows:

The Philippines.—Petroleum distribution is now being handled by a military-guided company known as "Pacific Oil Storage Co.," in which Standard-Vacuum Oil Co., California Texas Oil Co., and Asiatic Petroleum Corp. are the three participants. The declared independence of the Philippines, on July 4, is not expected to interfere with this setup.

China.—While foreign oil companies are generally ready to resume prewar distribution operations, such unknown factors as the Chinese Government's policy on movements of foreign-flag vessels on Chinese rivers and along her coastal shipping lanes, remains unsettled. At present, foreign-flag vessels are not permitted to operate on the rivers or along the coastal lanes without special permission—a condition that did not exist before the war.

Japan.—While there has been some hope of normal commercial oil activities resuming here by 1948, oil officials on General MacArthur's staff shake their heads and state "it will be a long, long time after that." Meanwhile, five commercial oil companies, however, have been asked to assist the military and late in June drafts of letters of intent (between the companies and the military) were in the final stages. Plans are for these five companies—three of which are the same as those operating in the Philippines under almost identical conditions—to handle all petroleum products from the time tankers arrive in Japan until the gasoline is dumped into military vehicles. In addition to the three oil companies already mentioned (as operating in the Philippines) Tide Water Associated Oil Co. and Union Oil Co. of California will be included in the plan for Japan.

In the Philippines, Pacific Oil Storage Co. (commonly called Posco) has leased the military's storage facilities—the majority of their own having been destroyed during the war—and as of June 1 of this year started to operate the Bataan terminal and the South Manila bulk plant. Terminal storage at Bataan is now about 400,000 bbl., but eventually this will be built up to 920,000 bbl., and maybe larger.

Until additional storage is available, the military will continue to sell petroleum products to the oil companies in the Philippines. Limited shore storage is the same throughout these islands, with Luzon perhaps not as well off as other areas.

Assuming the military program materializes as planned, the three oil companies will be able to obtain all the products they require to meet their market demands—limiting such requirements only by the quantities which have been slated for civilian consumption.

The storage at South Manila provides for 35,000 bbl. of aviation gasoline and 50,000 bbl. of motor gasoline. As of June 1, Posco started operations of this plant and is now handling the distribution of military-owned petroleum products to meet both military and civilian requirements. The same holds true for operations at the 400,000-bbl. Bataan storage site. When Posco's operations are no longer necessary from a military standpoint, and when sufficient private storage has been constructed and possibly bought from the military, it is assumed that the three participating companies which comprise Posco will be allowed to resume operations on a private-company basis, the same as before the war. Of course, with the July 4 independence of the Philippines, there may be a few slight operational changes, but nothing of a drastic nature is anticipated.

On Bataan, the military plans to provide and pay for materials for an additional 920,000 bbl. of storage. When the storage is completed, it is planned to store there 360,000 bbl. of

aviation gasoline; 240,000 bbl. of motor gasoline; 80,000 bbl. of diesel oil; 120,000 bbl. of kerosene, and 40,000 bbl. of range oil, leaving an unallocated tankage of 80,000 bbl. While no provisions have been made here for black-oil storage, it is assumed that the private companies will handle this phase of operations.

Construction of a drum plant on Bataan is being planned for the Army which will also provide funds for its construction. The date of completion is not yet known, but it will be operated by Posco, presumably on a standby basis, inasmuch as military requirements will not be sufficient to keep it in full operation. And presumably Posco will use it for making or assembling commercially required drums.

When Posco's charter was drawn up, operations were set on a cost-plus basis, and Posco did not take title to the oil, acting purely as a storage and handling company. However, participating companies have pointed out that for legal reasons they would prefer invoices to go direct to the oil companies, a detail which is now being worked on.

A factor which currently complicates oil problems in the Philippines is the oil-barge and tanker scarcity. China's extreme need for more and more transportation facilities, as emphasized by Gen. George Marshall, United States ambassador to China, has resulted in surplus vessels in the Philippines being sent to China. Under these circumstances, military authorities report that there is not much indication, at present, of the availability of many vessels in which oil companies in the Philippines would be interested. Thus, the military transportation of oil products to the Philippines apparently will continue for quite some time.

Moreover, a number of bolted knocked-down steel storage tanks of 5,000 and 10,000-bbl. capacity, and some used 55-gal. steel drums, which were in the Philippines, reportedly also have been moved to the Chinese mainland.

Chinese Legislation

In China, foreign oil companies are wondering if Chinese legislation will be passed prohibiting the operation of foreign-flag vessels on China's rivers and coastal shipping lanes. If such legislation is passed, foreign oil companies would have to be dependent on Chinese shipping firms which could charge whatever rates they choose. Meanwhile, the State Department's Far East intelligence division has contracted with the president of Ming Sung Industrial Co., the largest private shipping firm in China, in an effort to get his views on when the Chinese will commit themselves on the proposed legislation.

China, however, may waive the proposed shipping regulations in view of the surplus vessels being turned over to the United Nations Relief and Rehabilitation Administration, for UNRRA ultimately plans to turn these over to China, and reportedly might intimate that a ban on foreign-flag shipping would be inimical to United States-Chinese relations.

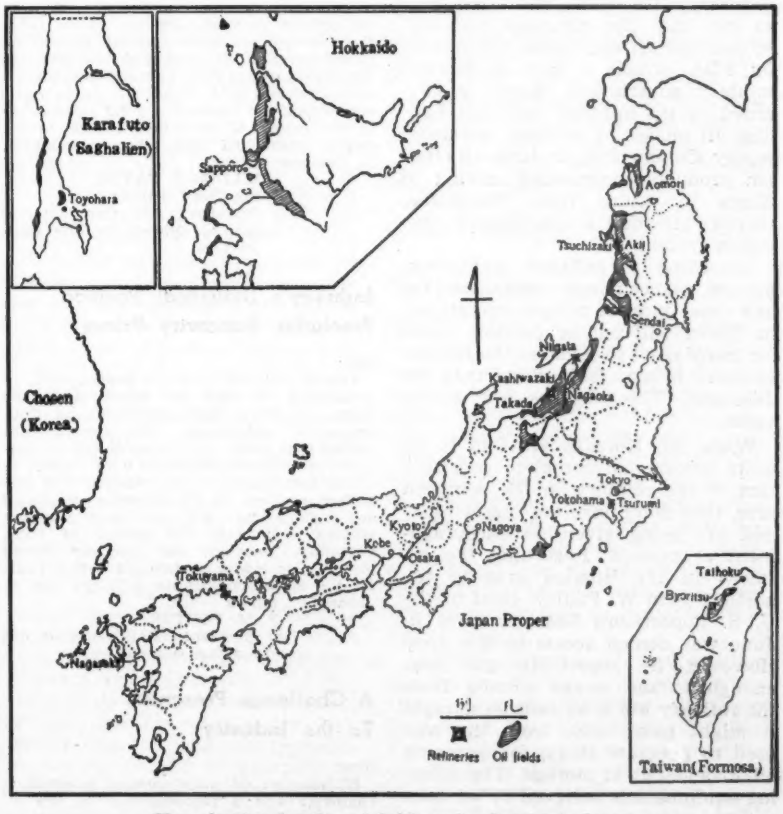
The vessels which the Office of Foreign Liquidation Commissioner has jurisdiction over, and which have been marked for eventual Chinese operation, have not yet been turned over to the Chinese Government for the latter has not been ready to accept and operate them. Moreover, the Chinese Government readily recognizes its difficulties in this respect and has indicated that it has no desire to alter current UNRRA oil supply operations.

Exactly what will be the function of the recently organized state-operated China Petroleum Corp. is not yet known. This new agency has been charged with the task of developing the country's petroleum industry in the interest of national defense and economy. Production, refining, transportation, and marketing operations presumably will be directed by Dr. Wong Wenhao, general manager of the corporation which has its offices in Shanghai.

Generally speaking, the private oil companies which had prewar operations in the Shanghai-Yangtze River area are back, with the military importing only what the oil companies cannot handle due to lack of storage facilities. The Army is making service contracts with the oil companies there to store and distribute Army-owned lubricants to meet Army shore requirements. This does not include marine lubricants which will he handled by the Navy.

Meanwhile, China's policy with regard to the acquisition of distribution and transportation facilities remains a puzzle. In fact this puzzle extends to production operations, for while it is known that the National Resources Commission of China would like to start extensive exploration activities, the question of obtaining funds is a current drawback. The recent acquisition of 4 sea-going and 18 river tankers is another factor which probably will enter the over-all picture and the question remains: Does China plan to operate its own inland and coastal oil transportation to the exclusion of foreign-flag vessels? Even when all the facts and figures are assembled, well-informed sources state that nobody, including the Chinese Government, is certain of the postwar oil picture there.

Concerning the oil-supply picture



Map showing location of fields and refineries in Japan

in North China (meaning the area north of Shanghai, excluding Manchuria), the oil companies, for the most part, are handling civilian requirements from their own imports. The military has turned over only a small quantity of its products to essential civilian needs.

In Korea, where there are known to be two refineries, the political situation is about the same as in Germany where the country is divided into areas of Allied occupation. This situation has had a distinct influence on the oil situation there, for practically all the oil installations of any importance are located north of the 38° parallel which is the Russian sphere of influence, and Russia's lack of cooperation with her Allies in Korea is practically the same as elsewhere.

South of the 38° parallel, military authorities report that there is only one distribution center of any importance and that is the Rising Sun farm on Makino Island in Puzan Harbor. The occupation forces are centered around Seoul.

Korean Agency Organized

With the aid of civilian oil advisors (loaned by the interested oil companies), a "Petroleum Distribution Agency" was organized in Korea. Prior to that the Koreans had been attempting to run the old Chosen Petroleum Co. which had been a Japanese wartime monopoly. But the company's financial conditions were so bad that the company was dissolved and all operations taken over by PDA, which is part of Korea's military government. Korea is governed by the military and PDA handles all phases of civilian petroleum supply. Commencing in June, all civilian products commenced moving to Korea in drums from Yokohama, thereby effecting a considerable saving in freight.

According to military spokesmen, private oil company operations (or any other kind of private operations) in Korea will not be possible again for many years to come, as the Korean economy is reportedly worse than the Japanese. The yen has lost all its value.

While the Koreans are said to be quite anxious to complete construction of the refinery in the southern area, they don't have the "know how" and are being given no encouragement at present. Regarding the refinery in the Russian area to the north, Edwin W. Pauley, chief of the U. S. Reparations Mission, early in June was denied access to this area. However, he reportedly got near enough to see smoke coming from the refinery but later said he thought it might have come from the coal used to generate steam for pumping oil in and out of storage. The refining equipment is believed to be worn out and obsolete.

What Others Say

(Continued from page 56)

the oil business. The statistics of the industry have shown that since the first of the year we have been in balance as to supply and demand, the basis for OPA's lifting of price controls in other industries. Furthermore, the active competition in the oil business insures the public against any unreasonable increases in product prices.

As for crude prices, the oil industry has had only one 10-cent increase since 1938, granted April 1 of this year. Crude prices are now only at about 70 per cent of the 1926 level as against over 111 per cent for all commodities. It is only to be expected that at the proper time a necessary adjustment in price will be made to insure maintenance of oil reserves adequate both for our current domestic needs and for any national emergency. Most of the oil produced during the war at the frozen prewar prices can be replaced only by new discoveries at greatly increased costs of exploration and development. Our producers need a worthwhile increase merely to break even on the added costs of exploration, to which, of course, should be added the far higher costs of operating today. It would seem logical that all these cost factors will be considered in any adjustment of crude prices, to bring them more nearly in line with the increased costs of other commodities.

FRED W. SHIELD,
President, Texas Mid-Continent Oil and Gas Association.

Hopeful That Oil Will Reach Parity With Other Commodities

Sirs:

I think it is regrettable that a national policy which has been and which is desirable, should have been so mishandled and misapplied by "bureaucratic bunglers," as to cause its complete abolition. This, in my opinion is what happened to the OPA. Had its policies been applied across the board fairly to all, neither the oil industry nor others would have had any grounds for complaint and OPA would still be in existence doing the country a great service. As to the future of oil prices, I hope to see parity established with other commodities in the near future.

WILLIAM T. PAYNE,
Big Chief Drilling Co.,
President, American Association of Oilwell Drilling Contractors.

Industry's Statistical Position Precludes Runaway Prices

Sirs:

The oil industry over the past months, in presenting its case for decontrol to the Office of Price Administration and Congressional committees, has always contended that there was no possibility of runaway or inflationary prices with respect to crude petroleum or its products. The statistical position of the industry precluded any such trend; and the same situation obtains now, with the passing of OPA. Certainly, however, the producer should in the near future be favored with a price for his oil commensurate with the cost of production plus a profit.

F. M. PORTER,
President, Mid-Continent Oil and Gas Association.

A Challenge Presented To the Industry

Sirs:

Elimination of price control presents a challenge and a responsibility to the oil industry which I have every confidence the industry will meet in a way that will assure the American people an adequate supply of petroleum products at reasonable prices and at the same time give assurance that the ratio of reserves will be maintained. It is my judgment that any price increase which may result will be moderate and certainly will not exceed and perhaps not equal the increased costs which the industry has been unfairly compelled to absorb for the last few years.

WALTER S. HALLANAN,
President, Plymouth Oil Co.,
Temporary chairman, National Petroleum Council.

No Runaway Market on Crude or Products

Sirs:

There will be no runaway market in the petroleum industry either on crude oil or refined products. Neither will there be any shortage of supply. However, the producer cannot find, develop, and produce oil at the present market. Now that OPA is no longer in existence there is no reason for delay in increasing the price of oil. The purchasers should show their good faith by immediately raising all prices a minimum of 25 cents per barrel. Any stalling and sitting on the side lines to see what is going to happen cannot fail to raise doubt in the minds of the producers as to the sincerity of the many statements by purchasers that prices would be increased when price restrictions were removed.

RALPH T. ZOOK,
Independent operator, former president, Independent Petroleum Association of America.

Diversified and Competitive Conditions in Oil Industry Cited

Sirs:

I regret that complexities of the subject do not permit any substantial forecast of the effect of ending of OPA price controls on an industry as diversified and competitive as petroleum. Lifting of ceilings will doubtless have a tendency to increase some prices but as to how much, what products, and in and for what periods of time I hesitate to hazard a guess without thorough analysis and more information than is presently available to me. As to oil alone, I have on previous occasions expressed the view that controls could be safely removed with supply and demand so closely in balance. The termination of OPA controls as a whole, however, is another matter and carries broad implications.

RALPH K. DAVIES,
Temporary director, The Oil and Gas Division, Department of the Interior.

Three States Boost July Allowables

Increased daily oil allowables for July in Oklahoma, Kansas, and Louisiana, continuing the upward trend which began in May, were announced by the states' conservation bodies last week.

In Louisiana, the July allowable was set at a record 428,641 bbl. daily, up 10,000 bbl. daily. A 10,000-bbl. daily increase also was authorized for July by the Kansas Corporation Commission. The Oklahoma Corporation Commission set July production at 385,545 bbl. daily, against 380,000 bbl. daily in June.

The Kansas Corporation Commission also pointed to a rising demand for crude in setting the July total.

WASHINGTON WATCHING

BY HENRY D. RALPH

Leasing Bill Opposition

WASHINGTON. — Secretary Krug has reiterated the Interior Department's opposition to the Hatch-O'-Mahoney oil leasing law (S. 1236) which has already passed the Senate.

In a letter to the House committee on public lands he said that the bill contains provisions which are obviously designed to benefit special interests to the detriment and injury of the public. He described the royalty provisions as indefensible and unjustifiable, and said the flat royalty of 12½ per cent will cost the Government several million dollars, adding that the Senate did not fully understand the significance of the various provisions.

This bill passed Senate by unanimous consent without a word of debate, but it had been the subject of very extensive hearings by the Senate public lands committee, including a series in the Rocky Mountain states. At these hearings representatives of the oil and gas industries were unanimous in favoring the changes in the law which were included in the measure as it passed the Senate, as well as a number of other liberalizations which failed to be included.

At the final hearing in Washington Interior Department officials vigorously opposed the changes sought by the industry, but most of their objections failed to sway the Senate committee which had heard the industry's arguments well presented. In addition to eliminating the sliding scale of royalties now charged by the department for production from the public domain, the bill would make many other changes in the public land leasing law, all designed to increase drilling and exploratory operations and open up the public land states to greater oil and gas development.

Mineral Resources Policy

ON his recent trip through the West, Secretary Krug says he spent a good deal of time conferring with representatives of the mining industry and found that they have the universal complaint that most of their problems involve some government agency and that the national government policy regarding mineral resources is not sufficiently well defined.

This fitted right in with the secretary's own ideas, and he is more than ever determined to have his department lay the basis for a national resources policy which will outline legislation and administrative actions regarding oil, gas, and other minerals. He has already started the department working on an inventory of our resources, and before many months he hopes to lay a tentative program before industry for comment. As a result of his trip Krug said he is even more determined to cut red tape and improve the administration of government regulations pertaining to the natural resource industries affected by the Interior Department.

Agency Shuffling

THE House has turned thumbs down on President Truman's reorganization plan to absorb the General Land Office and the Grazing Service into a new Division of Land Management in the Department of the Interior and to give the new agency jurisdiction over mineral leasing of national forest and other lands administered by the Department of Agriculture.

Under the reorganization act such a plan goes into effect within 60 days after submission to Congress unless in the meantime it is disapproved by an affirmative vote of both houses. Unless the Senate accepts the House resolution by July 15 the plan will take effect in spite of the House action, and at the moment it is doubtful whether the Senate will get around to acting by that date.

There was no opposition whatever to the Interior Department shifts proposed by the president. It was one of 28 similar shifts and consolidations lumped in three formal "plans," and only 4 of the 28 met much opposition, but the rules do not permit Congress to amend a reorganization plan so all three plans were voted down in toto. A good many members of the House complained that the 24 reorganization proposals to which there was no specific objection were of questionable value because there was no promise that they would result in economy and not too much prospect that they would promote increased efficiency in government operation. On the other hand, other members argued that consolidations and elimination of duplications in the Government are desirable ends and are worth a try. It is probable that the land use organization proposal would be accepted by Congress if submitted again by itself and considered on its own merits.

Parten Declines U. S. Job

JUBAL R. PARTEN, Houston oil man, has declined the offer to head the economic council which is to administer the so-called "full employment" act, President Truman told his press conference last week, citing as the reason the fact that the Government cannot pay high enough salaries to attract top-notch men from industry.

The president tied this remark in with a letter he recently wrote Senator Tobey of New Hampshire criticizing him for leading the fight against confirmation of another oil man, Edwin W. Pauley, as under secretary of the Navy. The president told Tobey that he and the former Secretary Ickes, in their fight against Pauley, had made it increasingly difficult to induce industry executives to accept government positions because of their fear of political attacks against them.

An interesting commentary on this situation is the proposal advocated by William S. Batt, industrialist and former official of the War Production Board, that large corporations revise their pension and retirement plans so that their top executives can retire at a reasonably young age and accept government positions supplemented by their retirement pay. Batt says this would achieve the double objective of promoting younger executives in industry and getting more industry executives into government.

Outlook for the Treaty

THE Anglo-American petroleum treaty looks pretty dead for this year. It has been lying in the Senate committee on foreign relations for more than 6 months without any action whatever. Hearings were once scheduled to start in March, but the State Department decided it would be expedient to postpone public discussion until after Congress had acted on the British loan proposal. This took a lot longer than anticipated, but the House probably will vote on it this week, which should clear the deck for the oil treaty.

However, Chairman Connally of the Senate committee is currently in Paris assisting Secretary of State Byrnes at the conference of "Big Four" foreign ministers and when he returns he is expected to devote most of his attention to the primary election in Texas. The committee could

hold hearings without its chairman, even though he does represent the biggest oil-producing state, but this is not likely. Congress is set on adjourning in a few weeks and the oil treaty is not apt to get special consideration as an emergency measure.

The treaty will not die with the adjournment of Congress but will continue to lie before the Senate for ratification unless withdrawn by the president. Some treaty drafts have lain before the Senate for many years without ratification. However, opponents of the oil treaty believe that the long delay has been fatal to it and that it will remain dormant forever without Senate action on ratification.

OGD's Funds Trimmed

ONLY $400,000 to operate the Oil and Gas Division during the new fiscal year was carried in the Interior Department appropriation bill as finally approved by Congress.

The Senate had approved the Budget Bureau request for $449,516, but the conferees chopped this down to an even $400,000, and it went to the White House that way. However, $216,908 of this sum had already been earmarked for the old Petroleum Conservation Division for administration of the Connally "hot oil" act, which leaves the OGD with far less money than it expected for its new plans. Rather than trim their garment to fit the cloth, Interior officials are considering asking for a supplemental appropriation later on when, they hope, Congress will be in a less parsimonious mood.

NPC's First Meeting

THE first meeting of the National Petroleum Council was quite successful, in the view of Secretary Krug, in spite of the fact that many of the members expressed considerable concern over the possible activities of the Oil and Gas Division.

The secretary told his press conference he gave the industry assurances that all war powers formerly exercised by the Petroleum Administration for War have been dropped and that the OGD will be concerned solely with better administration of the peacetime laws administered by the Interior Department. He expects to ask the council's advice on all sorts of problems involving the Government and the oil and gas industries, such as estimates of reserves, the import policy, synthetic fuel program, and many others, and he said he is confident the council will have many new views which will improve government administration and be generally helpful.

Krug hedged a bit when asked if he felt it proper for the council to hold secret meetings, saying that in the War Production Board it was found that industry advisory committees worked best when meetings were not open to discussions by nonmembers and when outsiders were not present to "misinterpret" what was said.

Organization Plans

ACTING Chairman Walter S. Hallanan of the National Petroleum Council has not yet appointed the committee of 15 to make plans for the next meeting, permanent organization, and other aspects of the council. It is understood he wants to obtain a transcript of the June 21 meeting before taking any further action. A transcript was taken by a court-reporting firm, but copies have not yet been distributed by the Interior Department. Acting Director Ralph K. Davies of the Oil and Gas Division had hoped that this committee would be appointed and hold its first meeting within a week after the council meeting.

PAW Historical Record

THE history of the Petroleum Administration for War and the oil industry's war service has gone to the Government Printing Office, but because of mechanical problems in that shop it will not be off the press for at least 6 months.

In the meantime the copy and the galley proofs will be rechecked for possible errors and omissions, a continuation of a process which has been going on with great care for many weeks. The history will be an imposing volume, some 170,000 words of text, 80 photographs and charts, and a dozen appendices. Unlike most government reports it will be almost letter-head size (8 by 10½), printed in large type two columns to the page, and bound in cloth. It will probably sell for around $2.25 per copy. The American Petroleum Institute has already ordered 10,000 copies for distribution to public libraries, colleges, and elsewhere.

Dr. John W. Frey, who was an assistant deputy administrator of PAW, has been working on the history for many months, aided by many other former PAW employes and several professional writers hired with funds donated for that purpose by the Petroleum Industry War Council when it liquidated its affairs. No pains have been spared to make it complete and accurate. Each PAW division and each district committee was required to submit a detailed history plus supporting files and documents, and these have been revised and condensed several times. Each draft was circulated to all officials who were concerned and to oil companies whose activities were described, and revisions were made as comments were received.

The text is a running discussion of the war problems that arose and how they were met, while the appendices cite authorities for all statements and include detailed statistics and other supplemental data. All war emergency agencies were instructed by the White House to prepare histories of their activities, but if a prize were offered for the best one Dr. Frey is confident his opus would walk off with top honors.

Fight Over the Tidelands

STRONG opposition to the tidelands resolution already passed by the House and now pending in the Senate was expressed by Secretary of the Interior Krug at a recent press conference. The resolution would disclaim all federal title to submerged oil and other lands and affirm state jurisdiction over them. For weeks Senator McCarran of Nevada, chief sponsor of the resolution, has been awaiting an expeditious moment to call it up for debate, but enactment looks more doubtful as the session of Congress draws toward a close. Meanwhile the Supreme Court is preparing to act this fall on the Justice Department suit to establish federal ownership.

Krug said Congress should not take any action until the Supreme Court decides the legal question of where the title rests. If it is determined that the federal Government owns the lands, then Congress could act to give them away, Krug said, but the Department of the Interior would fight any such move, believing that if the Government owns these lands, it should keep them and supervise their oil and other development.

Incidentally, the department is going ahead with plans for exploration of the continental shelf extending into the ocean beyond the 3-mile limit, regardless of what happens on the tidelands question. It has submitted to the Budget Bureau preliminary estimates of the funds needed to start underwater geological and geophysical work.

Sunray Oil Stockholders To Consider Merger Plan

NEW YORK. — Stockholders of Sunray Oil Corp. have been notified of a special meeting July 19 in Wilmington, Del., to consider the proposed merger of Transwestern Oil Co. into the Sunray organization.

Sunray has filed a registration statement with the Securities and Exchange Commission for $20,000,000 of 20-year debentures, due 1966, and 1,000,000 shares of $1 par-value common stock. The securities will be offered publicly by New York underwriters as a part of the financing of the merger.

Among the leaders of the Pennsylvania Grade Crude Oil Association at the meeting of the organization last week in Pittsburgh was this group—W. C. Wenzel, executive manager of the association; W. F. Clinger, retiring president; D. T. Ring, new president, Preston Oil Co., Columbus, Ohio; Fayette B. Dow, vice president and general counsel, Washington; Samuel Messer, (reelected) treasurer, Quaker State Oil Refining Co., Bradford, Pa.; and H. A. Logan, vice president, Union Refining Co., Warren, Pa., and a prominent leader in the association since its organization. Not present are B. T. Haskins, Ebenezer Oil Co., Wellsville, N. Y., first vice president (reelected); George J. Hanks, South Penn Oil Co., Bradford, Pa., second vice president; W. R. Reitz, Quaker State Oil Refining Co., Bradford, assistant treasurer; and C. L. Suhr, Pennzoil Co., Oil City, Pa., chairman of the board of directors

Penn Grade Refiners Study Means for Increasing Production

by Arch L. Foster

PITTSBURGH.—Refiners of Pennsylvania crude gathered here this week to discuss ways of increasing crude production, and to report progress in other phases of the work of the Pennsylvania Grade Crude Oil Association. While Pennsylvania production is up some 4,000 bbl. per day from the earlier low of 59,000 bbl. per day, the supply is still inadequate to meet demands, and many refiners, especially smaller companies, are in straits for enough crude to keep their plants in full-time operation.

Predictions of crude-production decline, made at the meeting of the association 4 years ago, have materialized essentially as expected, G. H. Sheldon, advertising president, told the meeting, and this situation requires another view of the advertising situation. Much of the association advertising has been directed to the consumer, and the acceptance of these products has become so strong that whole advertising budgets of non-Pennsylvania lubricating-oil refiners have been devoted to the task of breaking down this strongly entrenched position of Pennsylvania oils, Sheldon said.

While some retrenchment doubtless should be made in such expenditures, yet any decision "to emasculate the aggressive united front you have maintained against all other oils" would please competitors and be extremely harmful to the industry in Pennsylvania, Sheldon indicated.

Twenty distinct benefits of a working interest unitization of oil pools were presented to the meeting by W. A. Heath of Phillips Petroleum Co. They include spreading engineering and similar costs, lower equipment prices, cheaper power rates, elimination of duplication of effort and equipment, and especially an increase in recovery by operating to a lower economic limit and the development of less promising, "leaner" areas.

In many areas of the Pennsylvania Grade districts, lease-boundary lines are most irregular, resembling jigsaw puzzles. These conditions, Heath stated, make it impossible to effect any semblance of efficient secondary recovery without unitization of both working and royalty interests. It is necessary under those conditions to disregard well-spacing and injection wells along lease lines since it would, as practiced in other areas, entail prohibitive costs.

One of the major problems is that of inducing lease owners or operators to relinquish direct individual control of their properties but the benefits to be derived from unitization far outweigh any disadvantages which result from pooling of control. It is bad practice to wait too long to begin unitized operations such as water flooding in an old field, Heath stated. Each year brings more evidences of casing failure which permit extraneous water to enter the producing zone and interfere with later flooding operations.

Chemical Sand Plugging Advantageous

Selective plugging of sands in secondary-recovery operations is highly advantageous, said H. C. Lawton, research associate in the association's laboratories, in reporting on results of experimental work carried out on that principle. Such methods decrease the bypassing of oil and gas through "thief" sand and lower pumping costs for both input and production. Input into the less permeable sands can be increased in this manner, correspondingly raising production rates. Drowning of gas wells during drilling, by intrusion of stray water from sands penetrated, can be prevented by the use of this method, Lawton stated. Experience in plugging treatments has shown conclusively that it is of the greatest importance to have equipment in tiptop condition, and that the physical condition of the hole must be the best, to show best results from plugging operations. Lawton discussed the preparation and application of silica-gel-forming solutions, and of urea-formaldehyde resin-forming combinations.

Investigation of the activities of specific bacteria in the removal of paraffin from wells is under way as

part of the association's research program although no conclusive results were reported by J. V. Beck, microbiologist with the research group. Some types of bacteria have been shown to have serious effects on the plugging of the sand face of input wells, Beck said. Black sludge is formed in water lines by sulfate-reducing bacteria which have been found in many fresh waters and most produced waters in Bradford field. It seems desirable to consider and to study the possibility of pipe-line and well-tubing corrosion under anaerobic conditions.

Increases in water-intake rates of 50 to 300 per cent in input wells treated experimentally with hydrochloric and hydrofluoric acids was reported by R. J. Pfister, chief of the secondary-recovery research laboratory. This acidizing operation is carried out by running a macaroni string of ¾-in. or 1-in. pipe with or without jets to clean, by high-pressure water, the sand face of any material that can be loosened. A solution of 30 per cent inhibited HCl, 72 gal., plus 160 cu. cm. of a wetting agent, are pumped into the well. Two 50-lb. slugs of HF may be added between the twenty-fourth and thirty-sixth gallons of HCl if only one treatment is used. After pumping in the acid a metered amount of water is pumped in to force the acid into the formation. Shut-in and wash-out schedules require 24 to 72 hours, the time depending on the suspected condition of the well, and the results desired. Future data on these results will be required to determine how nearly the desired goal has been approached.

Corrosion in Oil-Gas Drives

Necessity for "pulling a well" is caused quite as often by materials becoming lodged in the pumping mechanism as it is by rod or tubing failure caused by pitting or general corrosion, said H. A. Pray, of Batelle Memorial Institute, in reporting results of a study on this subject. Studies of sediments, which include materials deposited while the brine stands static in the tubing during idle periods, show that hydrated iron oxides, $Fe(OH)_3$ and calcium carbonate, $CaCO_3$, form a large percentage of these deposits. The major constituent varies in different deposits; in some iron products predominate; in others, the carbonate is the main constituent, which may vary in content from practically nothing to half or more of the whole deposit, Pray stated. In some cases silica is found, up to 10 per cent, which is apparently the maximum. Brines have a general average composition, suggesting their common origin, including mainly sodium, calcium, and magnesium chlorides in decreasing order of magnitude. Sodium composes 25 to 28 per cent of the total solids content. Wells containing mixtures low in oxygen and carbon dioxide show the least corrosion.

Sodium hexametaphosphate, with the trade name Calgon, and zinc chromate, one or both, are the best corrosion inhibitors when added to brine solutions. The glassy phosphate also tends to reduce calcium-carbonate scale precipitation. Pray recommended elimination of galvanic couples between the brass barrel and other equipment parts either by insulation or by zinc protectors. Galvanized rods and tubing are recommended for replacements.

ABSTRACTS

Of papers presented at the meeting of Pennsylvania Grade Crude Oil Association

Progress of Selective Plugging Studies by Chemical Methods

H. C. LAWTON, Research Associate, Pennsylvania Grade Crude Oil Association research laboratory, Bradford, Pa.

SEVERAL advantages are to be gained from selective plugging of sands in secondary-recovery operations. Among these advantages are: (1) decreased bypassing of water and gas through thief sands, (2) lowered pumping costs both input and production, (3) increased input into the less-permeable sands with resultant increased rate of oil recovery, (4) saving costs of long strings of casing in cable-tool drilling wells, (5) the advantages gained from larger holes drilled into production or input horizon and, (6) the advantage gained from preventing drowning of gas wells during drilling operations by water entering from stray water sands.

The preparation, properties, and composition of applicable silica gel-forming solutions and urea-formaldehyde resin-forming solutions are presented.

The results of 10 experimental field treatments with these chemical plugging agents are discussed. Three of the treatments are presented in detail. Experience gained in carrying out the plugging treatments conclusively show the importance of having equipment in good mechanical condition and of having the hole in the best physical condition.

Results to date indicate that chemical plugging agents can be used in water, oil and gas wells throughout the entire Pennsylvania Grade area to control excessive flow of water into cable-tool drilling wells, to seal off thief sands in both water and gas input wells, and to control water-oil and oil-gas ratios in producing wells.

Increasing Water Intake Rates by Acidization

R. J. PFISTER, Head of Secondary Recovery Research Laboratory, Bradford, Pa.

NINE Bradford water-input wells have been experimentally acidized by the association's research staff with hydrochloric (HCl) and hydrofluoric (HF) acids in six different localities. All but one have shown increases in intake rates from 50 to 300 per cent. Preliminary data on oil production indicate favorable results are being obtained. The method of acidization involves running a macaroni string of 1-in. or ¾-in. pipe with or without jets to clean the sand face of any material which can be loosened with high-pressure water. A christmas-tree arrangement is used to jet high-pressure water either down the macaroni string or down the regular tubing with vents on either line. The acidization experiment involves running in about 72 gal. of 30 per cent inhibited HCl with 160 cc. of wetting agent. If only one treatment is desired 100 lb. of 50 per cent HF are added in two slugs between the twenty-fourth and thirty-sixth gallon of HCl. The acid is pumped into the macaroni string with the aid of a small centrifugal pump. Great care must be taken to avoid the slightest personal contact with the HF. The acid is forced into the formation by metering in the right amount of high-pressure water. The pressure and shutin schedule for the next 24 to 72 hours and well wash-out time depends on the suspected condition of the well and anticipated future acidization experiments. The methods are aimed to clean the sand face and to open up the sands of low intake rates. Future data on water input profiles and oil production will determine to what extent this goal is achieved.

The Role of Bacteria In Crude-Oil Production

J. V. BECK, Microbiologist, Pennsylvania Grade Crude Oil Association research laboratory, Bradford, Pa.

BACTERIA are small, unicellular organisms which are of importance because of their ability to increase in numbers rapidly and because they can grow in very diverse environments. Their activities are shown to be increasingly more significant in petroleum production.

Sulfate-reducing bacteria which are responsible for formation of black sludge in water lines and input wells have been found in many fresh well waters and in most produced waters of the Bradford field which have been analyzed. Many other types of bacteria have been demonstrated in input water and in backwash from input wells. These bacteria cause considerable plugging of the sand face of input wells.

The role of bacteria in pipe line and well tubing corrosion may also be of greater importance than at present realized. The possibility of corrosion under anaerobic conditions due to the activity of sulfate-reducing bacteria should be considered.

Investigation of the activities of specific bacterial cultures in removal of paraffin from producing wells and oil lines is also part of the research program of the microbiological section of the Pennsylvania Grade Crude Oil Association production research laboratory.

Unitization of Oil Pools for Secondary-Recovery Development

W. A. HEATH, Phillips Petroleum Co., Bartlesville, Okla.

FIRST major unitized operation in the United States solely for secondary-recovery development was the Delaware Extension pool, Nowata County, Oklahoma,

(Continued on page 70)

...to a problem vital to the PETROLEUM INDUSTRY

How *best* to prevent evaporation losses during the handling and storing of volatile petroleum products is more important today than ever before. Here are two of the most effective evaporation-saving devices available to the petroleum industry!

THE HORTON VAPORSPHERE

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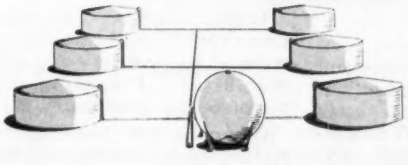
The operating principle of the Vaporsphere is extremely simple. It serves as the "heart" of a vapor-saving system. The vapor line from one or more storage tanks is connected to the shell of the Vaporsphere just below the equator. As the vapor enters the Vaporsphere (between the lower half of the shell and the membrane) the membrane billows upward to make room for the incoming vapor. At the same time, an equal volume of air above the membrane is displaced through a vent at the top of the shell. When the conditions which caused the vapor to enter the Vaporsphere are reversed, the vapor returns to the storage tanks, the membrane descends and air enters the space above it through the top vent. Thus, by preventing the vapors from leaving the system—evaporation losses are prevented.

The Vaporsphere normally operates at a pressure of ⅛ to ¼ in. of water. It can be connected to storage tanks without taking them out of service.



Diagrammatic sketch at left shows a Horton Vaporsphere connected to the vapor spaces of six cone roof tanks. Vapor displaced from the tanks by daily breathing or by unbalanced filling and emptying flows through the lines into the Vaporsphere and later returns to the tanks.

For more complete details on the Horton Vaporsphere, write our nearest office.

CHICAGO BRIDGE & IRON COMPANY

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Los Angeles, 14	1423 Wm. Fox Building	Washington, 4	703 Atlantic Building
Atlanta, 3	2154 Healey Building	San Francisco, 11	1254-22 Battery Street Building
Birmingham, 1	1536 North 50th Street	Detroit, 26	1514 Lafayette Building

Plants at BIRMINGHAM, CHICAGO and GREENVILLE, PENNA. In Canada: HORTON STEEL WORKS, Limited, FORT ERIE, ONT.

(Continued from page 66)

where (1926), a centrally located repressure plant was built to serve the entire 4,000 acres. The operation, handled through a stock company held by the former operators, has been highly successful.

Eleven projects have been unitized (total acres 4,200) in Greenwood County, Kansas. The production per well (depth 2,000 ft.) had decreased to about 2 bbl. daily. First four units were for gas repressuring, but the seven units formed since 1942 have been for the application of water flooding. Production without secondary recovery would be about 650 bbl. daily in comparison to the actual production of 4,800 bbl. daily, with as yet only a minor portion having been developed for water flooding.

Advantages of working interest unitization are: spreading costs of engineering, reduction of contract rates, quantity purchasing, standardization, more efficient use of labor, no duplication of plants, cheaper power rates, reduction in well-servicing equipment, use of central plants, no duplication of administrative and supervisory expenses, combined talents, lower economic limits.

Factors in the determination of equities were outlined, including oil in place, recoverable oil, accumulated oil production, acre feet of pay sand, productive acreage, number of wells, current daily production. Features of equity, royalty units, and operating agreements were treated.

Lifting of Steel Restrictions To Speed Refinery Building

WASHINGTON.—With all restrictions lifted from structural steel, and production rising rapidly since labor difficulties have been eliminated, there should be no delay in refinery construction, so far as structural steel is concerned, a spokesman for the steel-construction division of Civilian Production Administration said this week.

Deliveries at present are about 3 months behind but production is expected to exceed war levels shortly. The only indirect restriction, so far as steel is concerned, is the priority given harvesting machinery, veterans' housing, and military projects, according to CPA.

Venezuela Sees Royalty Increase in OPA End

CARACAS, Venezuela.—President Truman's veto of price control extension in the United States will lead to an increase in the Venezuelan Government's income from royalty on oil as a result of crude price boosts in the Gulf Coast area, it was predicted here this week.

A price increase of 25 cents per barrel would represent approximately $45,000 additional daily in royalties to the Venezuelan Government. Oil men here believe the end of the Office of Price Administration will quiet the Venezuelan Government's objections to United States price controls, which it was held interfered with the right of Venezuela to determine what royalties it should receive.

A.P.I. to Organize Six New Chapters in Production Division

DALLAS.—Six new chapters in the production division of the American Petroleum Institute will be organized and the Rocky Mountain district activated as a result of action taken by the A.P.I. board of directors at its midyear meeting here last week.

The new chapters will be at New Orleans; Corpus Christi, Tex.; San Antonio; Midland, Tex.; Lake Charles, La.; and Jackson, Miss. At present, the A.P.I. production division has 14 chapters, 4 districts—Southwest, Pacific Coast, Mid-Continent, Eastern—and some 2,500 members. The decision to activate the production division's fifth division in the Rocky Mountain area was taken in view of increased production activities in the section.

In a move to obtain wider representation from the industry on the A.P.I. board of directors itself, the group at the meeting here also voted to amend the bylaws to offer ex-officio membership on the board to presidents of a number of oil trade associations. The action means an increase in board membership from 110 to 133.

Invitations to board membership will be extended to the presidents of 20 trade associations. Under the plan, three additional members also will be named from state oil marketing associations as designated annually by the governing body of the National Council of Independent Petroleum Associations. The amendment specifies no one of the approximately 25 marketers' associations shall be nominated for representation on the A.P.I. board more than twice consecutively.

Terms of Office Limited

Under another amendment approved by the directors, no vice president of the institute will serve more than 2 years. Purpose of this step is to rotate the positions.

Other subjects discussed by the directors here included continued Office of Price Administration control of the oil industry, the recently organized National Petroleum Council, the A.P.I.'s new agricultural program, and oil industry public relations.

The directors decided to continue the public opinion survey and devote considerable time to the subject at the A.P.I. annual meeting November 11-15 in Chicago. One day of the annual meeting will be given to public relations with a number of specialists in the field scheduled to speak. The final committee report at the meeting here was given by Robert T. Haslam, New York, chairman of a public relations subcommittee now engaged in compiling data obtained from a national opinion poll.

The comprehensive program proposed by an A.P.I. committee to draw together agriculture and the oil industry was approved by the directors who decided to place the matter before the membership at the Chicago meeting. The program embraces special type of oil industry research of aid to agriculture, cooperation with chemurgic research groups and farm organizations, and promotion of farm mechanization.

The amount to be spent on the program was left to the committee to decide before the plan is presented to the membership at Chicago. "The rapid growth of farm mechanization has made agriculture an important customer of the petroleum industry," said William R. Boyd, Jr., A.P.I. president. "Therefore, it is only natural for us to help that customer remain prosperous and to assist him in efficient operation."

The next meeting of the directors will be held in Washington at a date to be set by Boyd.

Labor Dispute Settled At Toledo Refinery

TOLEDO, Ohio.—Four hundred employes of Pure Oil Co.'s Toledo refinery began returning to work on Tuesday following an agreement settling a labor dispute which has kept the plant idle for 6 weeks.

The agreement covers the major points under dispute and was signed by David S. Frank, refinery superintendent, and Kenneth Koch, plant chairman of Oil Workers Union (C.I.O.) Local 346. Employes will be brought back to work as rapidly as operating conditions permit, Frank said, and it is hoped that the majority will be at work by July 15.

Watchorn Oil & Gas Co. Controlling Stock Sold

OKLAHOMA CITY.—The name of Watchorn Oil & Gas Co. has been changed to Porter Oil & Gas Co., following the purchase by company employes of the controlling stock, J. R. Porter, president of the new organization, announced last week. No changes were made in personnel, policies, or activities of the company.

Attitude of Watchful Waiting Noted in Petroleum Markets

by Dahl M. Duff

PETROLEUM markets this week were free of the restraint of price control for the first time in more than 4½ years, but a cautious "wait and see" attitude developed in most industry quarters.

Prices were at ceiling levels on practically all products, and no sales above the former legal maximums were reported. The swift developments in Washington over the week-end left the marketing end of the industry with little time to study the situation.

General belief was that price increases will be held off until the picture in Washington has clarified. If it becomes reasonably definite a new control law will not be enacted, then price boosts are expected to materialize gradually.

Some observers felt the first break above the now defunct ceilings will come in crude. Crude has been in critically short supply with many smaller refineries for months, and "premium" payments on their part to obtain crude would probably lead to general upturn in postings.

The stripper well subsidy ended with the expiration of the Office of Price Administration. Agitation for continuance of this payment is expected to increase, since the anticipated crude rise of possibly 25 cents a barrel will not wholly compensate for loss of the government subsidy.

Two crude buyers were reported early this week to have higher crude postings ready as soon as it is learned definitely that no new price law will take effect.

Offerings of most products on the spot market were reported scarce or nonexistent early this week. Suppliers were reported to be filling contracts and moving as little material in the open market as possible. The principal published quotation for gasoline in the Mid-Continent area listed housebrand at a flat 6 cents.

In case a new law is not enacted, informed marketers expect a products price rise to appear first in gasoline and lubricating oils and possibly in residual fuel. Demand for gasoline has been extremely heavy, and lubricating oils are tight. While some improvement in the supply of residual has been apparent recently, it continues in heavy demand.

One market observer said he expected to see gasoline push up to 6¼ cents with no price control. Lubricating oils, he said will advance possibly 2 cents a gallon. Some buyers may pay 5 to 10 cents over the present Mid-Continent $1.18 a barrel "ceiling" figure.

Natural gasoline was reported still tight in the Mid-Continent area but quotations remained at 3¼ cents in Oklahoma and 2¾ cents in North Texas. Natural gasoline has recovered only partially from the sharp drop of last winter, and the present price in the Oklahoma area is 1½ cents under the former ceiling.

Prices of gasoline — branded, unbranded, regular and premium—were reported stronger at the end of last week in the New York area. A few scattered price raises were announced. Residual, No. 2, and kerosene remained tight in that section. Most gasoline was moving at 7.7 cents for premium and 6.8 cents for regular.

Price control in the oil industry dates back to the months before Pearl Harbor. Leon Henderson, former OPA administrator, on November 7, 1941, acted under a presidential proclamation and sent the first of three letters to members of the industry—producers, refiners, and all others engaged in the handling of petroleum and products—advising them that "in the interests of more efficient administration, no price advances be made in petroleum products without prior notice and approval from this office." Subsequent letters of November 10 and November 28, 1941, clarified policies.

Dallas Group Organizes New Chapter of Nomads

DALLAS.—Installation of the Dallas Chapter of National Oil Equipment Manufacturers and Delegates Society, and election of officers took place in the Petroleum Club, Adolphus Hotel, Friday night, June 28.

The following officers were elected: Noble A. Endicott, Continental Supply Co., president; Arthur A. Burrell, Cooper-Bessemer Co., vice president; L. A. Little, Lufkin Foundry & Machinery Co., secretary; E. G. Schroeder, Lucey Products Corp., treasurer; R. J. Bauer, Gardner-Denver Co., sergeant at arms; R. B. Moody, Jarecki Manufacturing Co., assistant sergeant at arms; and C. A. McClelland, International Derrick & Equipment Co., and S. S. Parker, National Tank Co., regents.

W. G. Green, Tulsa chapter and chairman of the board of regents, presided at the installation. He was aided in the ceremony by three other Tulsa nomads: Shep Miers, secretary of the board of regents; Jack Walton, past chapter president and regent; and J. A. Mussler, charter member of the Tulsa chapter.

Following a business meeting at which administrative details of the newly formed chapter were discussed, plans were tentatively formed for early meetings of the group. In addition to the officers, the following became charter members of the chapter: C. M. Powell, International Derrick & Equipment Co.; A. J. Olson, F. I. Brinegar, and F. M. Mayer, Continental Supply Co.; S. W. Webster, Emsco Derrick & Equipment Co.; Harry L. Layda, Dallas Tank Co.; H. C. Otis, Otis Pressure Control Co.; C. A. Brokaw, Eastman Oil Well Survey Co.; J. C. Baseheart, Buda Co.; Brad Mills, American Association of Oilwell Drilling Contractors; Robert Gallum, Security Engineering Co.; J. F. McFarland, Buda Co.; W. W. Klemme, Chain Belt Co.; James Aitken and Carl M. Anderson, International Derrick & Equipment Co.; Lowell Estes, Bethlehem Supply Co.; Allen F. Guiberson and Al Pranger, Guiberson Corp.; Fred W. Duemler, Walworth Co.; John B. King, Hercules Powder Co.; Max Campbell, Hughes Tool Co.; John Phillips, Pittsburgh Steel Co.; and Tom J. Crowley, Petroleum Engineer.

Lead Quota Unchanged

WASHINGTON.—Civilian Production Administration officials said last week the allocation of lead for tetraethyl manufacture during July will remain unchanged at 4,160 tons.

DEATHS

William H. Cunningham, Jr., 39, Evansville, Ind., lease broker formerly of Tulsa, died June 28 in Evansville.

N. E. Hancock, 57, field superintendent of Paul Moseback Oil Co., died June 27 at his home in Carlyle, Ill.

Samuel M. Holladay, 58, general foreman of the paraffin department at the Baton Rouge, La., refinery of Standard Oil Co. (N. J.), died recently. He had been associated with the refinery 33 years.

Chester C. Hester, 54, independent oil operator in the Mid-Continent area, died July 1 at Oklahoma City.

SHORAN: Precision RADAR

—a method of high-precision position finding in aerial navigation, mapping

by Stuart W. Seeley*

DEVELOPED during the war, and used for determining a plane's position with reference to a given ground point on blind bombing missions, Shoran is arousing considerable interest among oil men as to its possible applications to aerial geological observation, surveying, and mapping work in inaccessible terrain. This is a digest of a paper first presented before the American Institute of Electrical Engineers at New York, and later discussed before the Society of Exploration Geophysicists at Chicago and the San Antonio meeting of the A.I.E.E.

ALTHOUGH Shoran (Army Radar AN/APN-3 and AN/CPN-2) is a contraction of the words "Short" and "Range," it has given satisfactory performance to distances of 250 miles. It is used for high-precision position finding in aerial navigation. The original research work was started in the fall of 1938 by Radio Corp. of America, which later turned it over to the military. It finally came into its own as a war weapon in December 1944 in Italy.

The extreme accuracy of distance determination attracted the attention of the army geodetic and mapping groups. Tests in Florida proved that the probable error of distance measurement by this method was something less than 50 ft. out to the limit of its range (about 250 miles). As a result of the interest of these groups, the equipment is being used today for establishing control points with "'first order survey accuracy" at very great distances. (Note—"First Order Survey Accuracy" may be roughly defined as accurate to 1 unit in 25,000, or approximately 1 ft. in 5 miles).

*Radio Corp. of America.

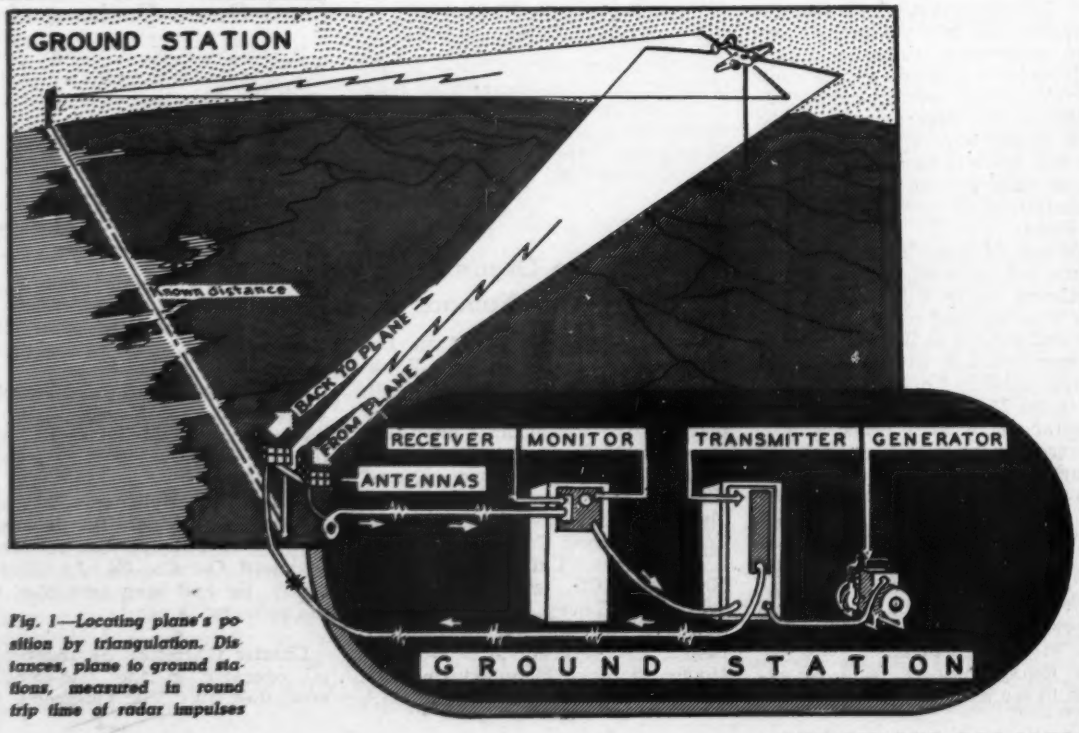


Fig. 1—Locating plane's position by triangulation. Distances, plane to ground stations, measured in round trip time of radar impulses

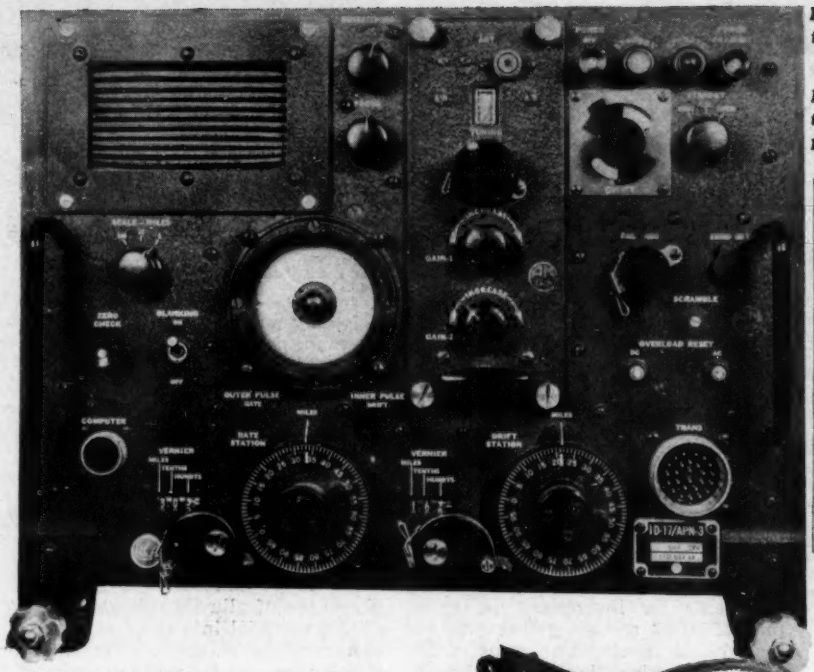


Fig. 2—(Left) Plane equipment. Panel of timing and indicating unit

Fig. 3—(Below) Plane equipment. Transmitter which can be mounted anywhere in plane

For this work a ground station is established at each point to be located and a plane flown back and forth across the line between any two such points. The average minimum sum of the distances between the plane and each ground station, as indicated by a photographic recorder for each line crossing, gives the true distance between the two points.

The comparative simplicity of sur-

(Continued on page 101)

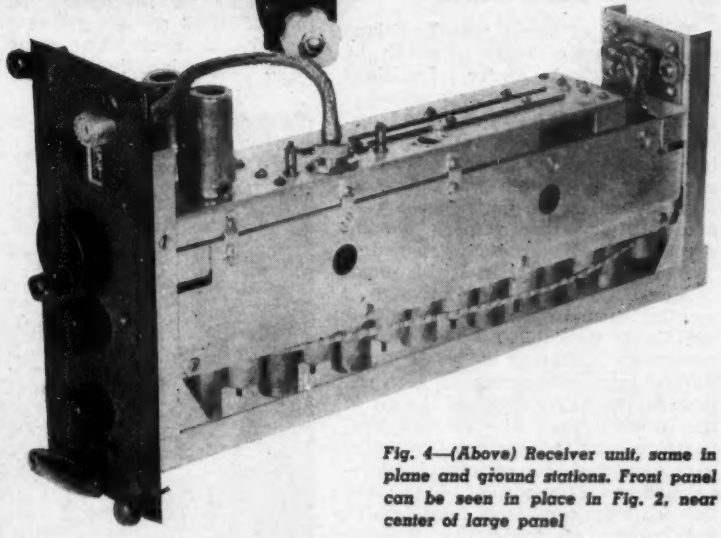


Fig. 4—(Above) Receiver unit, same in plane and ground stations. Front panel can be seen in place in Fig. 2, near center of large panel

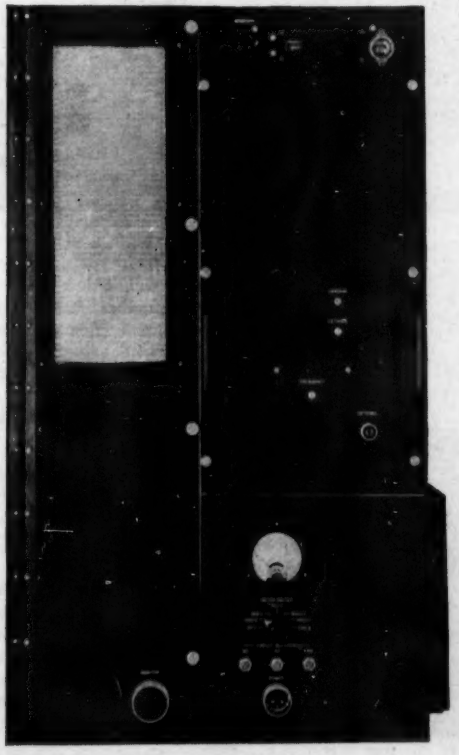
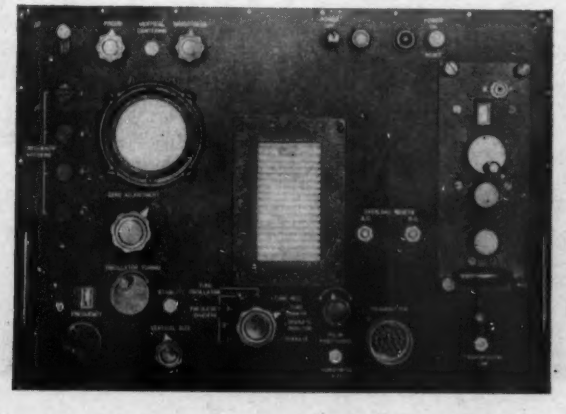


Fig. 6—(Left) Panel of ground station transmitter. See diagram in Fig. 1

Fig. 5—(Below) Panel of ground-station monitor-receiver. See diagram in Fig. 1



STEAM AND POWER GENERATION

In the American Refinery

PART 2

by William F. Ryan

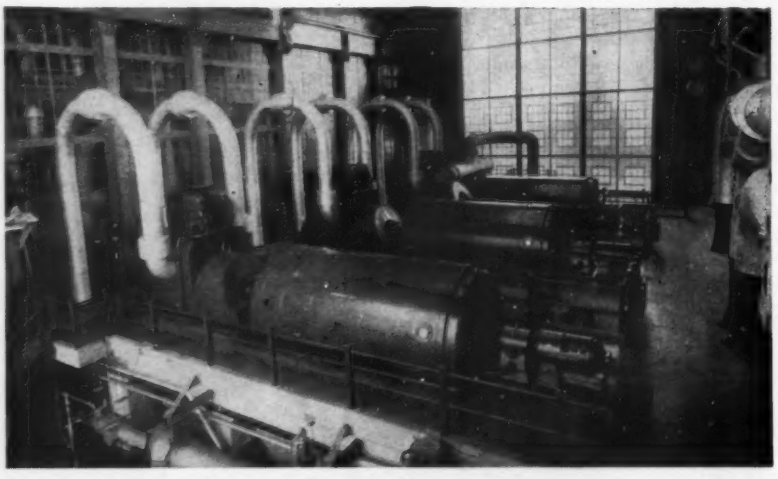
WHILE only eight high-pressure power plants had been built by petroleum refining companies before the war, others were installed and operated by public utilities, supplying process steam to refineries and delivering to their own systems any surplus "byproduct" power which might be generated. This afforded a means of utilizing the inherent potential of the refinery as a source of cheap power in days before the growth of allied chemical processes provided sufficient demand for power to justify plants of this type within the refinery itself.

Louisiana Station

The first of these was Louisiana Station at Baton Rouge. Although the plant's original owner, Louisiana Steam Generating Corp., was not a public utility, it is now owned and operated by Gulf States Utilities Co. into whose system surplus power generated by the station was delivered, or from which the deficiencies were made up when the refinery demand exceeded the byproduct generation. The original installation at this plant, designed and built in less than 8 months, started operation in 1930. It contained three 15,000-kw. turbine generators operating at 600 psi. and 750° F. and exhausting at 141 psi., in order to deliver 135-psi. steam to the refinery. At that time this temperature was the highest for which equipment had been commercially developed and a pressure of 600 psi. was the maximum considered feasible with the supply of feed-water makeup available at Baton Rouge.

When Louisiana Station was built, the conversion of Mississippi River water into saturated steam at nearly 500° F. presented chemical and engineering problems without precedent, and the whole power-generating industry owes much to the pioneer developments at this station. The present water treating plant is shown in Fig. 6. This plant precipitates 15 to 20 tons of mud and silt every day from the 4 to 5 million gallons of water treated, and consumes several carloads of chemicals every week. It represents an investment of more than $850,000, and altogether may be regarded as a chemical plant of no mean proportions in itself, although it is only an auxiliary installation to the main power generating plant.

All the water for boiler feed and turbine generator cooling services is treated in this plant. The water is drawn from the Mississippi River through two 16-in. siphon pipes into a well that is 60 ft. deep and which is equipped with three 3,000-g.p.m. motor-driven deep-well-type pumps. The siphon well is located on the river bank far enough from deep water to be unaffected by seasonal deposition of alluvial soil and sliding of this material into the river, which occurs as the water level falls. The siphon pipes extend out to deep water,



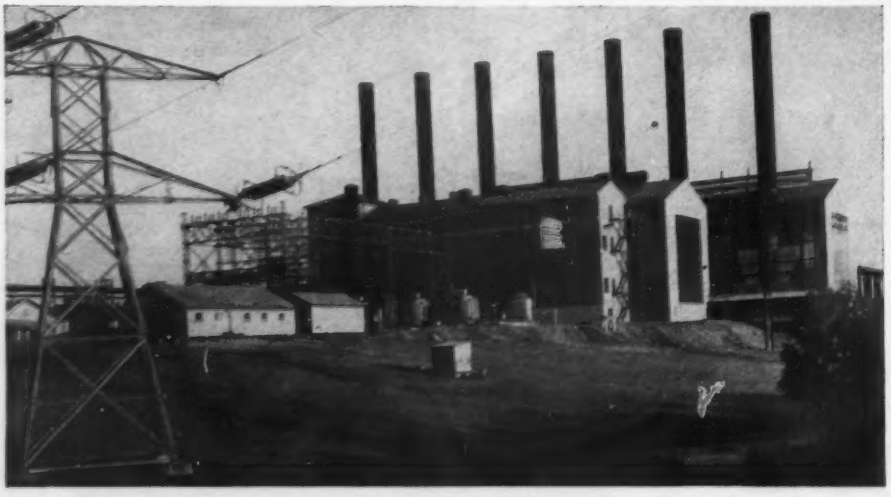


Fig. 1—(Left) Louisiana Station of Gulf States Utilities Corp. supplies steam and power to the Baton Rouge refinery of Standard Oil Co. of New Jersey. Turbine generator capacity 123,500 kw.; boiler capacity 3,000,000 lb. per hour

Fig. 2—(Above) Interior of original turbine room of Louisiana Station, containing three 15,000-kw. units. Three 25,000-kw. units and one 3,500-kw. house turbine have since been added

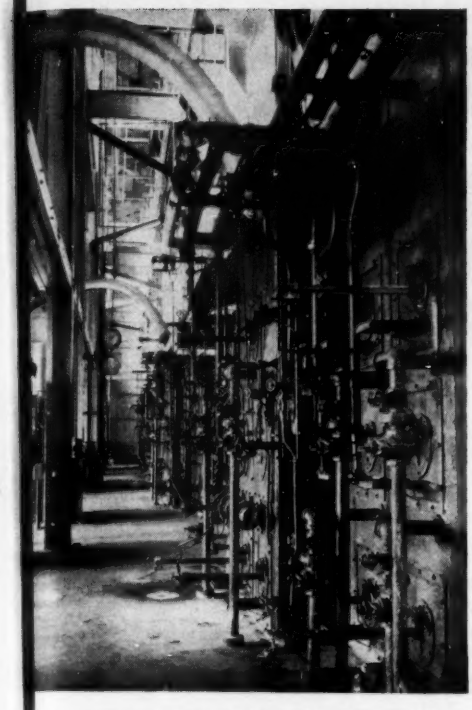


Fig. 3—Firing aisle, Louisiana Station. These boilers are equipped to burn 12 different fuels, most of them refinery residues

supported in a fairly flexible manner on independent piling with the expectation that they will be shifted somewhat, and may even break off during periods of high water.

The pumps deliver river water into the first stage tanks of the cold process treating plant, in which partial treatment for clarification and softening occurs. The water then flows into the second stage treating tanks for final clarification and silica removal, thence through gravel filters to the clear well where acid is added. From the clear well the water is pumped through zeolite softeners to the plant boiler feed make-up system, which includes a 200,000-gal. reserve-supply tank set 231 ft. above grade.

Water for cooling tower makeup and potable services is obtained from two artesian wells on the station grounds.

Louisiana Station has now grown to a capacity of 123,500 kw. with seven turbine generators and eight boilers of more than 3,000,000 lb. per hour total capacity. The plant, in conformity with general practice at the time of the initial installation, is a completely housed design. The exterior view shown in Fig. 1 does not show the latest addition; one turbine generator and one boiler were added during the war and no pictures were taken. Fig. 2 shows the interior of the original turbine room, and Fig. 3 the firing aisle and boiler fronts. The latter view may appear to present some complications until it is realized that these boilers are equipped to burn 10 or 12 different fuels, including natural gas, refinery gas, fuel oil, petroleum coke, acid sludge, soda bottoms, acid tar, alkaline sludge, wax tailings, pitch bottoms, and other refinery wastes as they become available from time to time. In addition to being a laboratory and pilot plant for the entire power industry in problems of feed water treatment, Louisiana Station has also been a pioneer in the technique of efficient disposal of refinery wastes.

As the plant has been expanded in the intervening years, no change has been made in operating pressure or temperature, but by refinements in heat balance the yield of byproduct power, in kilowatt hours per thousand pounds of process steam delivered to process, has been increased from about 36 in 1930 to more than 45 in 1946. Since a high ratio of power to process steam is the main objective

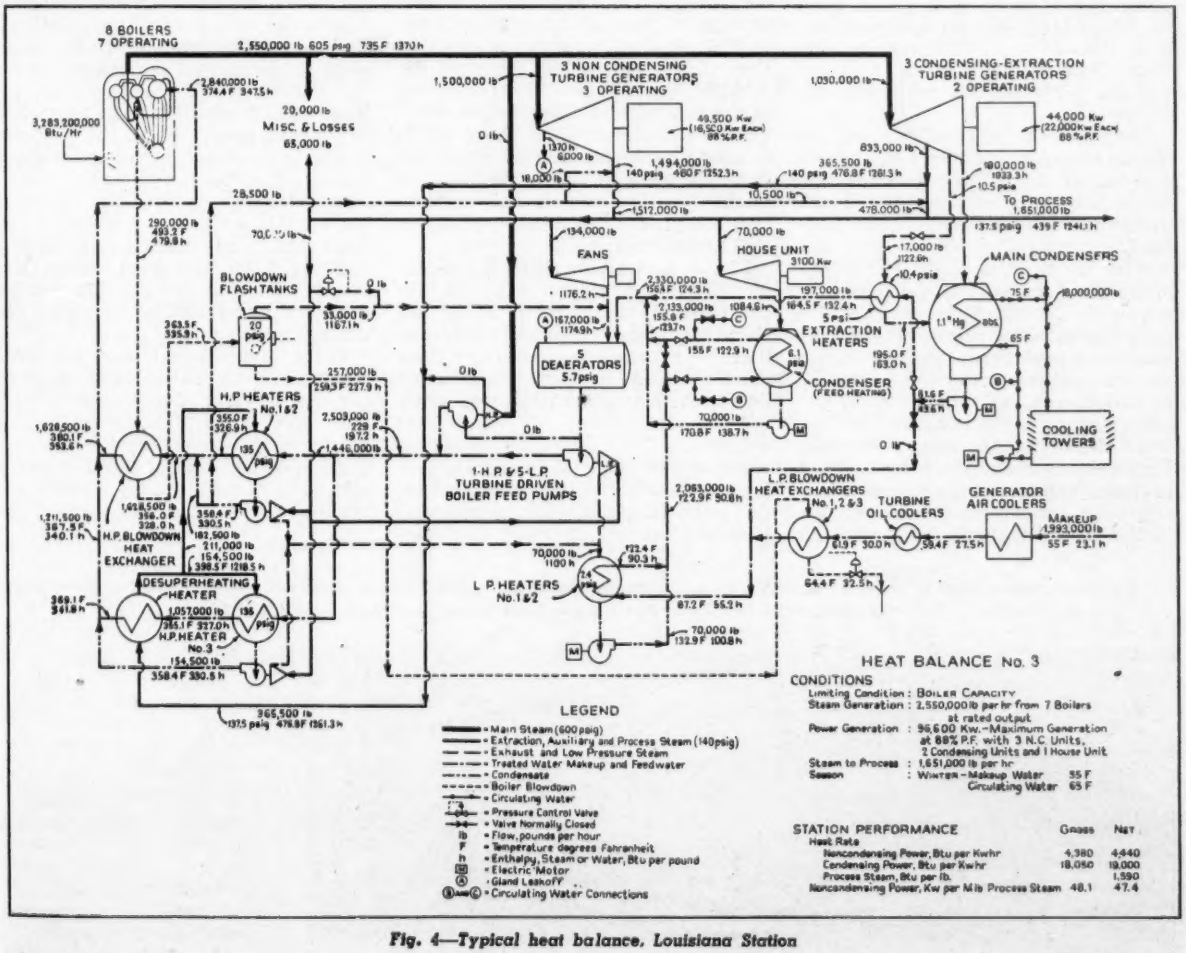

8 BOILERS 7 OPERATING
2,550,000 lb 605 psig 735 F 1370 h
3 NON CONDENSING TURBINE GENERATORS 3 OPERATING
3 CONDENSING-EXTRACTION TURBINE GENERATORS 2 OPERATING
MISC. & LOSSES 65,000 lb
BLOWDOWN FLASH TANKS
FANS
HOUSE UNIT 3100 Kw
MAIN CONDENSERS
5 DEAERATORS 5.7 psig
5 PSI EXTRACTION HEATERS
CONDENSER (FEED HEATING)
H.P HEATERS No.1 & 2
1-H.P. & 5-L.P. TURBINE DRIVEN BOILER FEED PUMPS
L.P. BLOWDOWN HEAT EXCHANGERS No. 1, 2 & 3
TURBINE OIL COOLERS
GENERATOR AIR COOLERS
COOLING TOWERS
MAKEUP 1,993,000 lb
H.P. BLOWDOWN HEAT EXCHANGER
DESUPERHEATING HEATER
H.P. HEATER No. 3
L.P. HEATERS No. 1 & 2
LEGEND
Main Steam (600 psig)
Extraction, Auxiliary and Process Steam (140 psig)
Exhaust and Low Pressure Steam
Treated Water Makeup and Feedwater
Condensate
Boiler Blowdown
Circulating Water
Pressure Control Valve
Valve Normally Closed
lb = Flow, pounds per hour
F = Temperature degrees Fahrenheit
h = Enthalpy, Steam or Water, Btu per pound
Electric Motor
Gland Leakoff
Circulating Water Connections
HEAT BALANCE No. 3
CONDITIONS
Limiting Condition : Boiler Capacity
Steam Generation : 2,550,000 lb per hr from 7 Boilers at rated output
Power Generation : 96,600 Kw.—Maximum Generation at 80% P.F. with 3 N.C. Units, 2 Condensing Units and 1 House Unit
Steam to Process : 1,651,000 lb per hr
Season : Winter—Makeup Water 55 F, Circulating Water 65 F
STATION PERFORMANCE
Heat Rate
Noncondensing Power, Btu per Kwhr 4,380 4,440
Condensing Power, Btu per Kwhr 18,050 19,000
Process Steam, Btu per lb. 1,590
Noncondensing Power, Kw per M lb Process Steam 48.1 47.4

Fig. 4—Typical heat balance, Louisiana Station

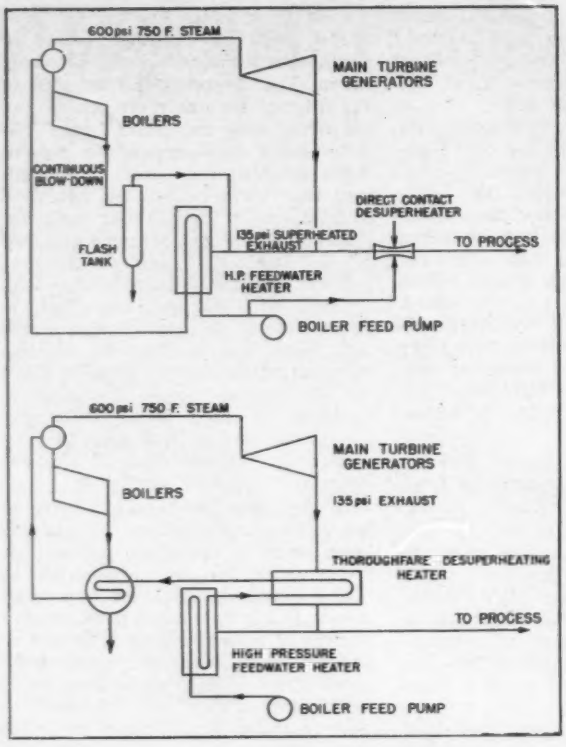


Fig. 5—Methods used to increase yield of byproduct power in Louisiana Station. The supply to the refinery of steam which has done no useful work in the main turbine is eliminated by substitution of a heat exchanger for a flash tank in the blowdown system, and use of a thoroughfare heater to desuperheat the exhaust, instead of direct injection of water

in a plant of this type, the simple and relatively inexpensive devices which secured this increase of 25 per cent in yield are of particular interest.

The present heat balance of the station is shown in Fig. 4. Fig. 5 shows a detail of the 135-psi. exhaust system as originally installed in 1930 and, in simplified form, as it has been modified.

With the throttle steam at 600 psi. and 750° F., steam is exhausted at about 460° F. when the turbines are fully loaded, and at about 500° F. at quarter load. Steam is delivered to the refinery at a uniform temperature of 439° F. and this requires some desuperheating of the exhaust.

As shown by the upper diagram Fig. 5, desuperheating of the exhaust to meet refinery requirements was originally accomplished by direct injection of boiler feed water into the process steam. The result of this was to supply part of the steam to the refinery in the form of vaporized feed water, which had not passed through the turbine, with a resulting loss of byproduct power. As shown in the lower diagram, desuperheating is now accomplished by passing the exhaust from the turbines through a thoroughfare desuperheater. This eliminates supplying steam to the refinery which has bypassed the turbine, generating no kilowatt hours. Moreover, the final feed-water temperature is higher, since about 15° F. is added by extraction of superheat from the exhaust. As a result, more steam passed through the turbine, and the yield of byproduct power is still further increased.

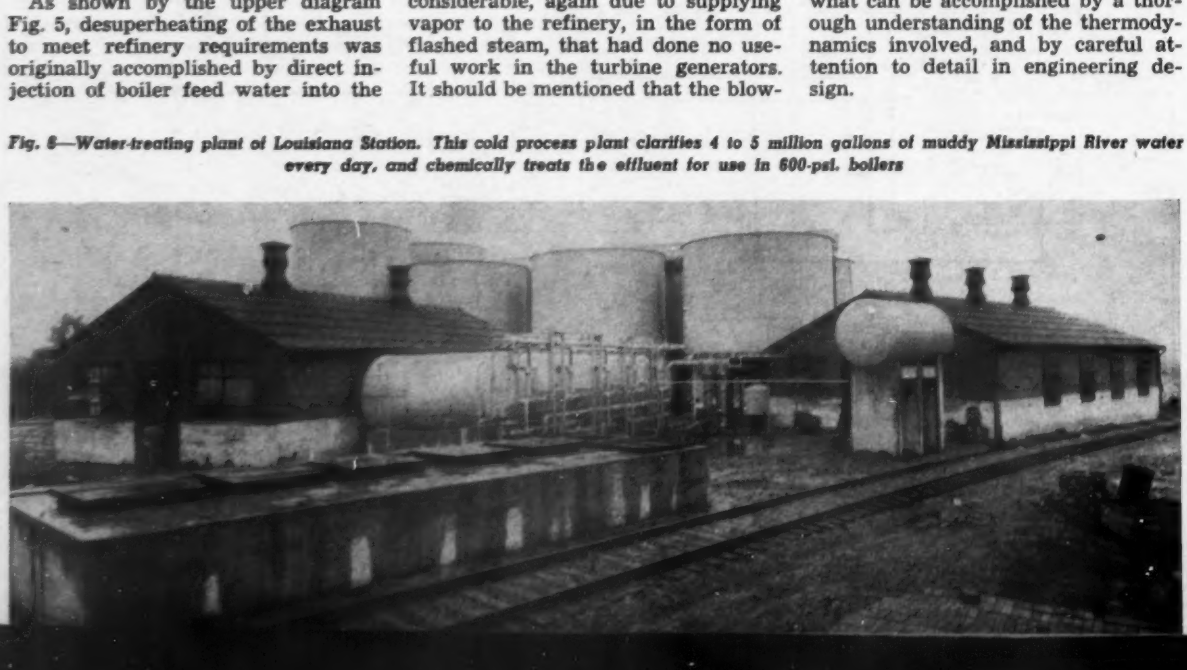
Fig. 5 also shows that the boiler blowdown was originally flashed into the 135-psi. exhaust main. While not shown in this simplified diagram, there was further heat recovery from the blowdowns at lower temperature levels; the actual heat loss was small but the degradation of energy was considerable, again due to supplying vapor to the refinery, in the form of flashed steam, that had done no useful work in the turbine generators. It should be mentioned that the blowdown in this plant is extremely high, amounting at times to more than 25 per cent of the total feed. Under present load conditions the total blowdown may exceed 500,000 lb. per hour at certain river stages. Had the original flash system not been changed, this quantity of blowdown would flash about 150,000 lb. per hour of vapor into the 135-psi. mains. This also would be steam delivered to the refinery without passing through the turbine, thereby reducing the yield of byproduct power by nearly 5,000 kw.-hr. per hour. As shown in Fig. 5, the original flash tank has been replaced by a heat exchanger. Somewhat less is extracted at the upper temperature levels, but this is recovered at lower levels and, as now installed, all of the 135-psi. steam delivered to the refinery is passed through the main turbines with maximum yield of byproduct power. The feed water temperature is increased about 25° F. in the heat exchanger.

"House Turbine" Installed

While all of the main auxiliaries are turbine driven, using 130-psi. steam, the feed pumps exhaust into condensers at a partial vacuum, and the fans to deaerating heaters at 5 psi., thus providing stage feed heating, the equivalent of one regenerative cycle commonly used in central stations. However, the exhaust from these units does not provide enough steam to maintain pressure in the deaerating heater and originally it was necessary to bypass steam from the 135-psi. mains to the 5-psi. auxiliary exhaust system. Therefore, a "house turbine" was installed to replace the reducing valve; this unit has a capacity of 3,500 kw. and normally generates 2,500 to 3,500 kw. from steam, the energy of which would otherwise be degraded by expanding through a reducing valve.

These and other minor improvements have effected an increase of 25 per cent in yield of byproduct power, and offer a forceful illustration of what can be accomplished by a thorough understanding of the thermodynamics involved, and by careful attention to detail in engineering design.

Fig. 6—Water-treating plant of Louisiana Station. This cold process plant clarifies 4 to 5 million gallons of muddy Mississippi River water every day, and chemically treats the effluent for use in 600-psi. boilers



IMPROVED DRILLING MUDS

Contain Carboxymethylcellulose

by H. H. Kaveler

This is the story of a new drilling-mud additive, from the practical field and cost side as well as from the chemical and physical viewpoints. While the chemical additive has an 8-syllable name, its basic source is the common substance "cellulose." This paper (introduction omitted here) was presented at the recent Mid-Continent district production meeting of the A.P.I. at Oklahoma City. Dr. Kaveler is assistant to vice president, production department, Phillips Petroleum Co., Bartlesville, Okla.

DRILLING muds are suspensions of solids in aqueous solutions, and, like all colloidal dispersions, have a limited life. Such dispersions tend to separate into concentrated masses of their respective phases. The rate of separation (the life of the colloidal system) is determined by the particle size, the difference in specific gravity of the dispersed phase and the dispersion medium, and the viscosity of the dispersion medium, in conformance with fairly well-established laws. The rate of separation is also determined in some measure by the chemical composition of the system.

It is well known that drilling muds, like other such types of dispersions, have a short life in the presence of high concentrations of soluble electrolytes. Their sensitivity to electrolytes varies in an approximate relationship with the valency of the offending ion. It is also true that certain substances tend to impart prolonged life or stability. Bentonite stabilizes dispersions of barite and water if dissolved salt concentrations are low. Certain organic colloidal materials in the class of water-dispersible starches and natural gums have been used or recommended as additives to stabilize mud dispersions in the presence of soluble salts.

Criteria of "Good" Mud

Colloidal chemistry fails to be an effective guide in the control of drilling muds perhaps because it is the chemistry of complex systems. The chemistry of pure substances can be expressed by useful rules and principles. But the chemistry of systems comprised of a wide variety of components substantially different in their pure chemical behavior, involves a complexity of reactions that lies beyond the realm of well-organized and intelligent knowledge. Certainly this statement applies to drilling muds so long as practical considerations of cost preclude an unlimited choice as to the composition of a circulating medium.

A "good" drilling mud should have the following properties:

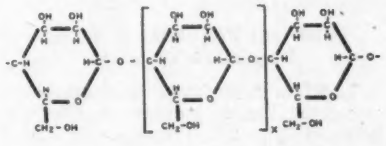
1. Low viscosity compatible with pumpability and carrying capacity for cuttings.
2. Stability of the suspension of the weighting material, particularly in muds weighing more than 12 lb. per gallon.
3. A high degree of thixotropy.
4. A thin, tough, filter cake of low permeability and of good deplastering quality.
5. Temperature stability.
6. High resistance to electrolytes.
7. Good response to treating agents and control of properties.
8. Low electrical resistance.
9. Capacity to release larger-size cuttings and release gas in the mud pit.
10. Immunity to chemical or bacterial action.
11. Retards capacity to swelling of "bentonitic" or "heaving" shale.
12. Low initial and maintenance cost.

Such a list of criteria for a good drilling mud is impressive by the fact that a drilling mud must meet a wide range and variety of uses and functions. Many materials and combinations of substances have been suggested as circulating fluids in rotary drilling operations in the effort to find muds that satisfy most of these requirements.

In view of the practical and economic limitations on the choice of compounds for drilling mud, researches were undertaken to seek improvement in the conventional aqueous drilling mud system. These researches led to the discovery that certain derivatives of cellulose, known as alkali metal carboxymethylcellulose, when added to the conventional aqueous drilling mud caused substantial improvement in all desirable characteristics. Mud containing alkali metal carboxymethylcellulose showed superior properties to any herefore used. The sodium salt is the cheapest alkali metal salt, and, for that reason, it is the salt of carboxymethylcellulose which will be used commercially.

Water-Dispersible Cellulose

Cellulose is the principal constituent of the woody parts of plants. Cotton is almost a pure form of cellulose; therefore the basic character of the material is well known. The chemical structure of cellulose may be represented by the following formula:



It is a very large molecule. The glucose unit indicated by the subscript "X" in the formula recurs more than 200 times in the molecule.

Cellulose is insoluble in water. It is, however, soluble in alkali, such as a 40 per cent aqueous solution of sodium hydroxide. In alkaline solution, the cellulose molecule is split into smaller units. The degree of splitting depends upon temperature, time, concentration of oxygen, and, concentration of

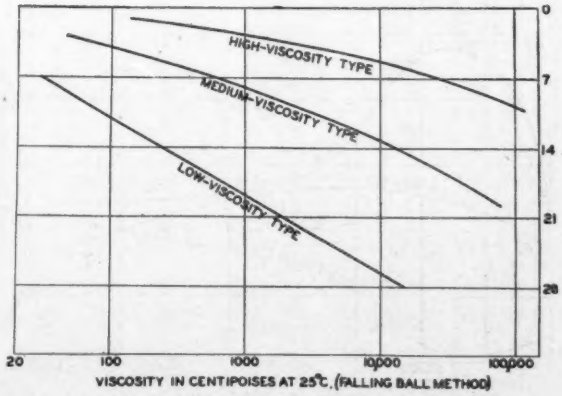
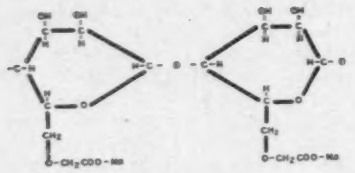


Fig. 1—Cellulose concentration in distilled water

caustic. The splitting reaction is the first step in rendering cellulose suitable for use in drilling mud. If the sodium cellulose formed by solution in caustic soda is treated with monochloracetic acid ($ClCH_2COOH$), a substitution occurs first on the primary hydroxyl group and, if the reaction is allowed to proceed further, next upon the secondary hydroxyl groups in such a manner as to yield a glycollic ether. When only the primary hydroxyl groups are reacted, the product carboxymethylcellulose is as follows:



This is the second step required to render cellulose suitable for use in drilling mud. The compound in this example is sodium carboxymethylcellulose. It is a white, granular, odorless, and tasteless powder having a specific gravity of 1.6.

The maximum substitution possible is three hydroxyl groups per glucose unit. If the substitution of the type shown is as much as 0.4, the sodium carboxymethylcellulose is water dispersible.

Important Properties of Water-Dispersible Cellulose

The free glycollic acid is insoluble in water but is soluble in alkaline solution. The alkali metal salt is the preferred form for use in drilling mud because it is readily dispersible in water. A point of interest in this connection is that the alkali metal salt of carboxymethylcellulose is an electrolyte, whose anion is large enought to fall within the colloidal classification of size.

One of the outstanding characteristics of alkali metal carboxymethylcellulose is their power to impart high viscosity to aqueous solutions. The degree of viscosity imparted to water solution depends upon molecular size as determined by the degree of splitting in the mercerization reaction, as well as upon the degree of substitution. For commercial application, such compounds can be prepared in a wide range of viscosity characteristics usually referred to as high, medium, and low range. The viscosity behavior in water is summarized by the data given in Fig. 1 for the three ranges of viscosity type of sodium carboxymethylcellulose.

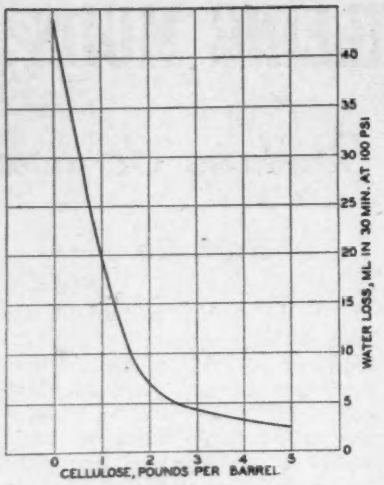


Fig. 2—Water-loss behavior as function of cellulose content

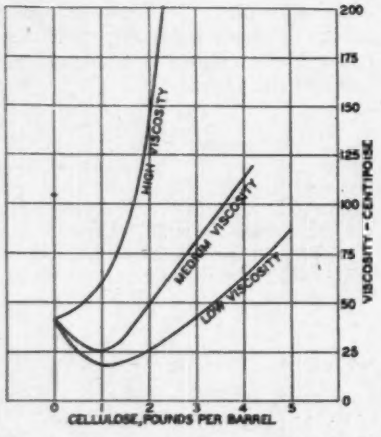


Fig. 3—Viscosity of drilling mud with different amounts and types of cellulose

Another outstanding characteristic of alkali metal carboxymethylcellulose is that they possess heat stability in aqueous solutions. Moreover, the viscosity of aqueous solutions show only a very slight reduction with temperatures as high as 212° F.

Alkali metal carboxymethylcelluloses are immune to bacterial or enzymatic action. They do not ferment under conditions of use in drilling muds. Mold growth occurs only under very special and controlled conditions.

Alkali metal carboxymethylcelluloses are not precipitated by salts in solution except for those salts that may be classified as the polyvalent amphoteric type, in the class of aluminum, lead, iron, tin, and copper. Of particular interest is the fact that calcium ion does not precipitate carboxymethylcellulose except from solutions nearly saturated with a calcium salt such as calcium chloride. This is important in connection with drilling muds in view of the resistance to anhydrite and cement contamination that the alkali metal carboxymethylcellulose imparts.

Cellulose derivatives of the type being discussed, have been known for at least 25 years. They were industrial products in Germany during World War 1. They have found a wide variety of uses ranging from application in the manufacture of crayon through a long list to include even the baking industry. No application of the material, however, is more interesting, nor more important, than that which resulted from the discovery of the pronounced beneficial effect of the cellulose derivatives in drilling mud. Perhaps no useful appli-

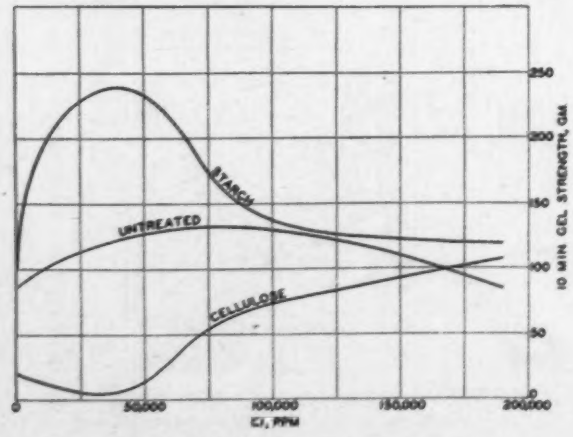


Fig. 4—Effect of salt on viscosity of mud

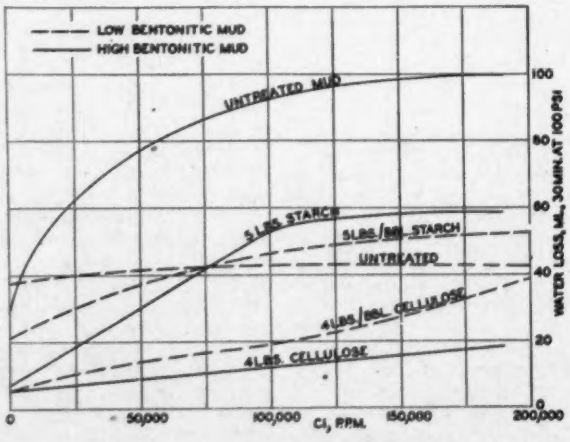


Fig. 5—Effect of salt on water-loss values

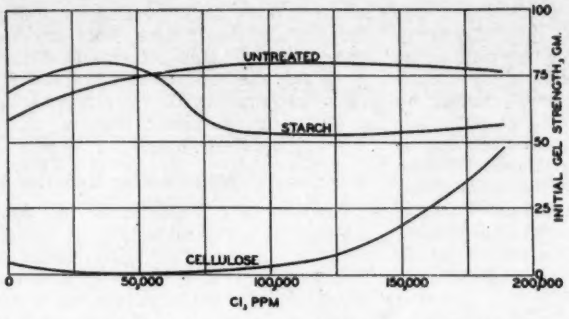


Fig. 6—Effect of salt on initial gel strength of mud

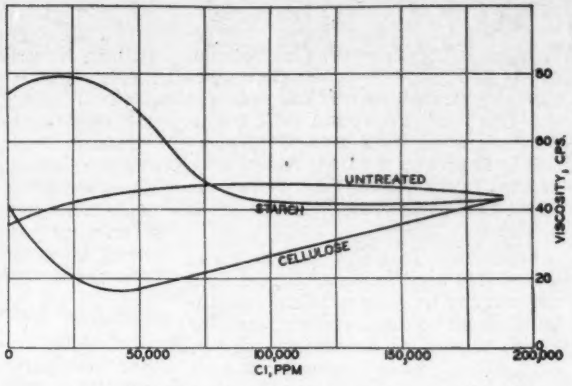


Fig. 7—Effect of salt on 10-minute gel strength of mud

cation of the material was more unexpected.

Properties of Muds Containing Carboxymethylcellulose

Researches involving a detailed laboratory appraisal have been completed and a number of wells have been drilled using sodium carboxymethylcellulose as a drilling mud additive. Experience and technical data developed to date indicate that sodium carboxymethylcellulose imparts superior characteristics to aqueous drilling muds. Its use has permitted a substantial reduction in direct mud costs. Beyond this, the good mud characteristics, and ease of mud control when it is used, have permitted substantial indirect savings in drilling and completion costs.

The general properties of the sodium carboxymethylcellulose mud are summarized as follows with the information presented based entirely upon the generally accepted test procedures of A.P.I. Code 29:

1. Water loss. — Sodium carboxymethylcellulose imparts to all varieties of aqueous drilling muds a low water loss in the standard filter press test. Standard water losses in the range of 3 to 4 cc. per 30 minutes can be obtained and maintained. The general result obtained in respect to this property is shown by Fig. 2. Low water-loss values can be maintained in the presence of high concentrations of soluble salts.

2. Filter - cake thickness. — Filter-cake characteristics of drilling mud with sodium carboxymethylcellulose are consistently in the range of 2/64 to 3/64-in. thickness.

3. Viscosity.—In spite of the marked effect of sodium carboxymethylcellulose in increasing the viscosity of water, it was surprising to discover that in drilling muds the viscosity increase of sodium carboxymethylcellulose is not excessive. In many instances, the viscosity of the mud is reduced. The viscosity resulting from the use of sodium carboxymethylcellulose depends somewhat upon the quantity of bentonites and nonbentonitic type clays present. The general behavior is represented by Fig. 3.

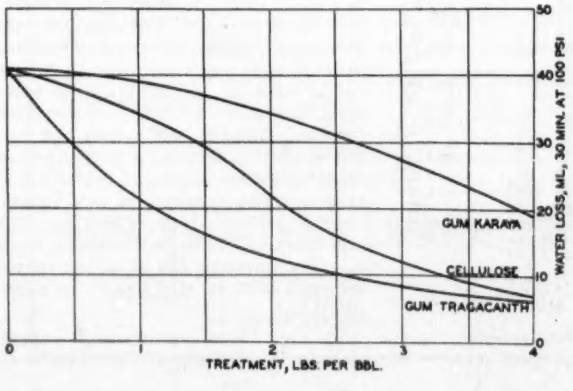
Viscosity control in useful operating ranges can be maintained in the presence of sodium carboxymethylcellulose, even when salt content is high. The general behavior in this respect is shown in part by Fig. 4.

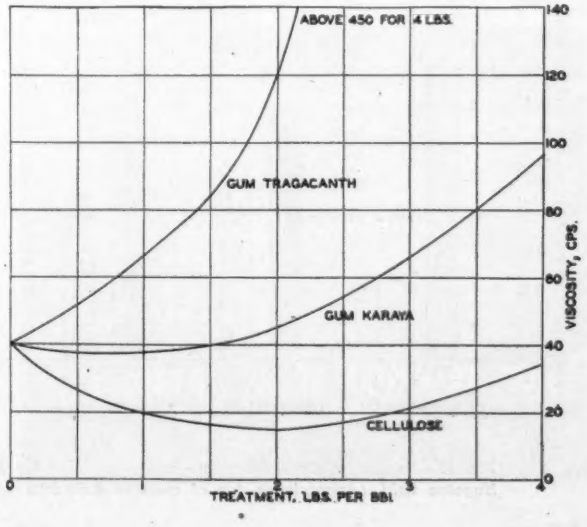
4. Gel strength.—Low gel strengths can be consistently obtained and maintained in drilling mud by the use of sodium carboxymethylcellulose. In any event, the thixotropic ratio, measured as the ratio of the 10-minute gel strength to the initial gel strength, is usually increased by the use of sodium carboxymethylcellulose. This is a very desirable condition. Gel strengths, however, depend upon the quantity and type of clay present. High-bentonitic-content muds show less decrease in gel strength than do those having high nonbentonitic type clay content. It is, however, quite possible to maintain initial gel strengths in the range 0 to 5 grams by the standard Stormer test, and 10-minute gel strengths in the range 20 to 40 grams, for any mud if salt concentrations are less than 75,000 p.p.m.

5. Resistance to salt flocculation.—Sodium carboxymethylcellulose has a remarkable ability to stabilize drilling muds in the presence of even high concentrations of soluble salt. This is particularly true in the case of sodium chloride and calcium salts, commonly encountered in the drilling operation. In this respect, sodium carboxymethylcellulose renders the mud truly salt water resistant. In the presence of soluble salt, low water loss can be maintained while viscosity and gel strengths can be readily maintained in acceptable and useful ranges. The

Fig. 9—Comparison of effects of cellulose with natural gums

Fig. 8—Comparison of effects of cellulose with natural gums





effectiveness of sodium carboxymethylcellulose in respect to its salt resistance is shown by the information given in Figs. 4, 5, 6, and 7, respectively, wherein salt was added to the salt-free mud. Resistance to salt concentrations in respect to all properties is improved if salt is added or is present in the drilling mud before the sodium carboxymethylcellulose is added.

Experience indicates that salt and anhydrite sections can be drilled without the treating problem encountered with either conventional or starch base muds. Conditions may be encountered where some treatment would have to be given for the presence of soluble calcium ion to reduce viscosity of the mud. If that is required, the conventional methods for removing calcium can be relied upon.

Comparison With Starch and Natural Gum

In recent years, water-dispersible starch has been widely used as a drilling-mud additive for the particular purpose of maintaining mud properties in the presence of high salt concentrations in the mud. Natural gums have been suggested as additives for mud for the same purpose. A summary of comparative tests of starches and gums as compared to sodium carboxymethylcellulose is given in Figs. 4, 5, 6, and 7, for starch, and in Figs. 8 and 9 for natural gums, indicating that sodium carboxymethylcellulose possesses superior properties to either starch or gum in the compounding of salt resistant drilling muds. Sodium carboxymethylcellulose has many distinct advantages beyond maintaining superior mud properties in the presence of high salt content. Sodium carboxymethylcellulose is not fermentable and is not subject to enzyme action. Sodium carboxymethylcellulose does not require maintenance of high pH since its range of usefulness lies at any point above 7.5. Sodium carboxymethylcellulose muds are stable at all temperatures encountered in drilling. Natural gums deteriorate too rapidly and give such high viscosities in mud as to cause them to be not very useful.

Sodium carboxymethylcellulose is different in chemical structure from starch or gums, and, the comparison made here with starch and gums is given merely for the purpose of comparing its properties in drilling muds with those of starches and gums.

Heaving Shale

Laboratory tests have demonstrated that bentonite and bentonitic minerals show little tendency to swell in contact with water dispersions of sodium carboxymethylcellulose. In fact, if moderate quantities of salt are present in solution with carboxymethylcellulose, the tendency to swell in contact with water that bentonite possesses is almost completely repressed. At the present time, a program of well drilling in areas underlain by thick shale sections is going forward. In due course, field experience will be had to determine whether or not the sodium carboxymethylcellulose mud will be effective in overcoming the difficulties of drilling in "heaving shale."

Summary of Well-Drilling Experience

Considerable experience in well drilling in areas underlain by either or both salt and anhydrite sections has been obtained. Such experience shows clearly that sodium carboxymethylcellulose muds permit substantial savings in direct mud cost and result in savings in drilling time.

In Fig. 10, experience in drilling wells in the Hugoton gas field is summarized. Weighting material is not added to the drilling mud in these operations. These wells were all drilled in immediately adjacent areas under drilling conditions that otherwise appeared to be quite comparable. The well drilled with sodium carboxymethylcellulose mud showed as high a rate of drilling and required substantially less quantity of drilling mud materials than other wells drilled with conventional mud. The conventional muds were subjected to various types of treatment and composition in an effort to improve and maintain good quality. The sodium carboxymethylcellulose mud requiring little if any treatment was in all respects superior to conventional muds used. The short drilling time required for these 3,000-ft. wells does not permit definite conclusions as to whether or not sodium carboxymethylcellulose mud actually resulted in any significant decrease in time of drilling. The salt section penetrated in these wells is approximately 800 ft. thick in the interval 2,000 ft. to 2,800 ft. in depth (Well D).

In Fig. 11, a summarized experience in the drilling of 10,000-ft. wells

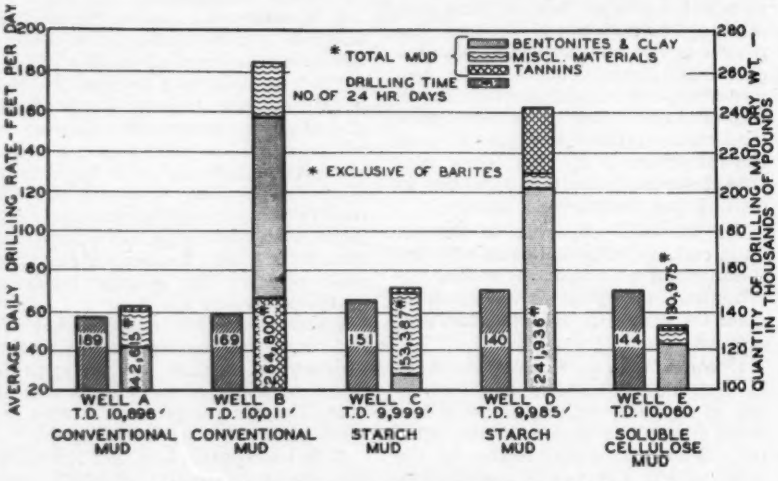


Fig. 11—Average daily drilling rate in feet per day for 10,000-ft. wells in South Tyler field. (Approximate top of massive anhydrite section, 9,300 ft.)

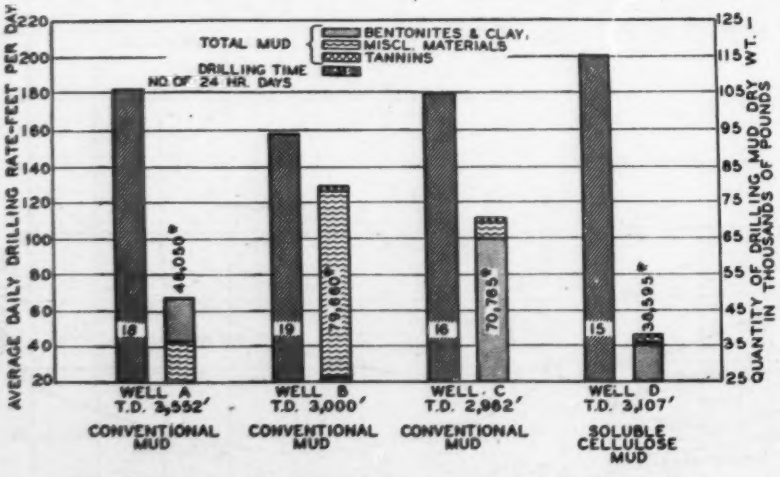


Fig. 10—Average daily drilling rate in feet per day for 3,000-ft. wells in Hugoton field. (Approximate top of massive anhydrite section, 2,100 ft.)

in the South Tyler field, Smith County, Texas, is given where two wells were drilled with conventional mud, two with starch-base mud, and one with sodium carboxymethylcellulose mud. The "weight of mud used" is exclusive of the weights of barite for the purpose of showing the quantities of clay and treating chemical required. The weighting material required for all wells was approximately the same. In the South Tyler field, anhydrite stringers are encountered in the interval 8,900 to 9,100 ft., while a 250-ft. anhydrite section occurs in the interval of approximate 9,300 to 9,550 ft. The usual practice is to carry 13½-lb. mud to approximately 9,400 ft., and, 14½-lb. mud to total depth. Sodium carboxymethylcellulose mud was used from a depth of 6,000 ft. after surface pipe was set. The average characteristics of the sodium carboxymethylcellulose mud, other than the weight just given, that were maintained below 6,000 ft. were: water loss, 5 cc. per 30 minutes; pH, 8.0; 10-minute gel strength, 40 grams; initial gel strength, 0 to 10 grams, and viscosity, 65 cp.

Advantages in Use

Advantages in the use of sodium carboxymethylcellulose mud are reflected by the substantially lower requirements for treating chemicals. The actual drilling time for the sodium carboxymethylcellulose mud compares favorably with the best rate of drilling achieved with any other type mud.

Other advantages of the sodium carboxymethylcellulose mud observed during the course of well drilling may be referred to briefly: low initial gel strengths obtainable cause the muds to readily release entrained gas, and, to drop cuttings in the mud pit rapidly. The mud responds readily to treating agents and is, therefore, not subject to overtreatment with resultant detrimental effects. The sodium carboxymethylcellulose mud shows an unusual ability to carry weighting material when weights in the range of 13 to 15 lb. per gallon are necessary.

Method of Handling Sodium Carboxymethylcellulose

The use of sodium carboxymethylcellulose in drilling mud involves no special procedures nor special equipment. The material is a nonhygroscopic solid that can be shipped in paper bags, stored and handled in the same manner as other mud components. The material goes into solution readily, but should be introduced with thorough stirring. This is most conveniently accomplished by using a vacuum-type hopper to introduce the material into the mud stream at a uniform rate. The sodium carboxymethylcellulose operates most efficiently in the presence of some salt concentration in the general range of 20 to 30 thousand parts per million of salt. If the sodium carboxymethylcellulose is used to counteract additions of salt or anhydrite to the mud, the best practice is to add the sodium carboxymethylcellulose before such additions occur. The quantity of sodium carboxymethylcellulose required varies with existing conditions and lies in the range of 1 to 4 lb. per barrel. The usual quantity is 2 to 3 lb. per barrel.

The present supply of sodium carboxymethylcellulose for use in drilling mud is quite limited, but, it may be expected that some quantity of material will be available in the last quarter of 1946. It is expected that a supply sufficient to meet the demands of the industry will be available in 1947.

Acknowledgment

This report is a joint effort on the part of many on the staff of Phillips Petroleum Co. C. R. Wagner was responsible for outlining the original research program. Members of the drilling-mud section of the drilling-tool division and of the production research section of Phillips Petroleum Co. contributed to the research and development of the sodium carboxymethylcellulose mud.

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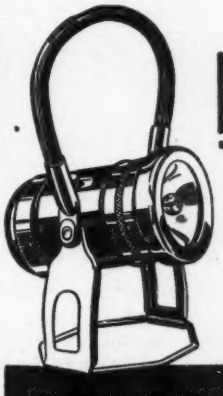

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Deep Rotary Drilling

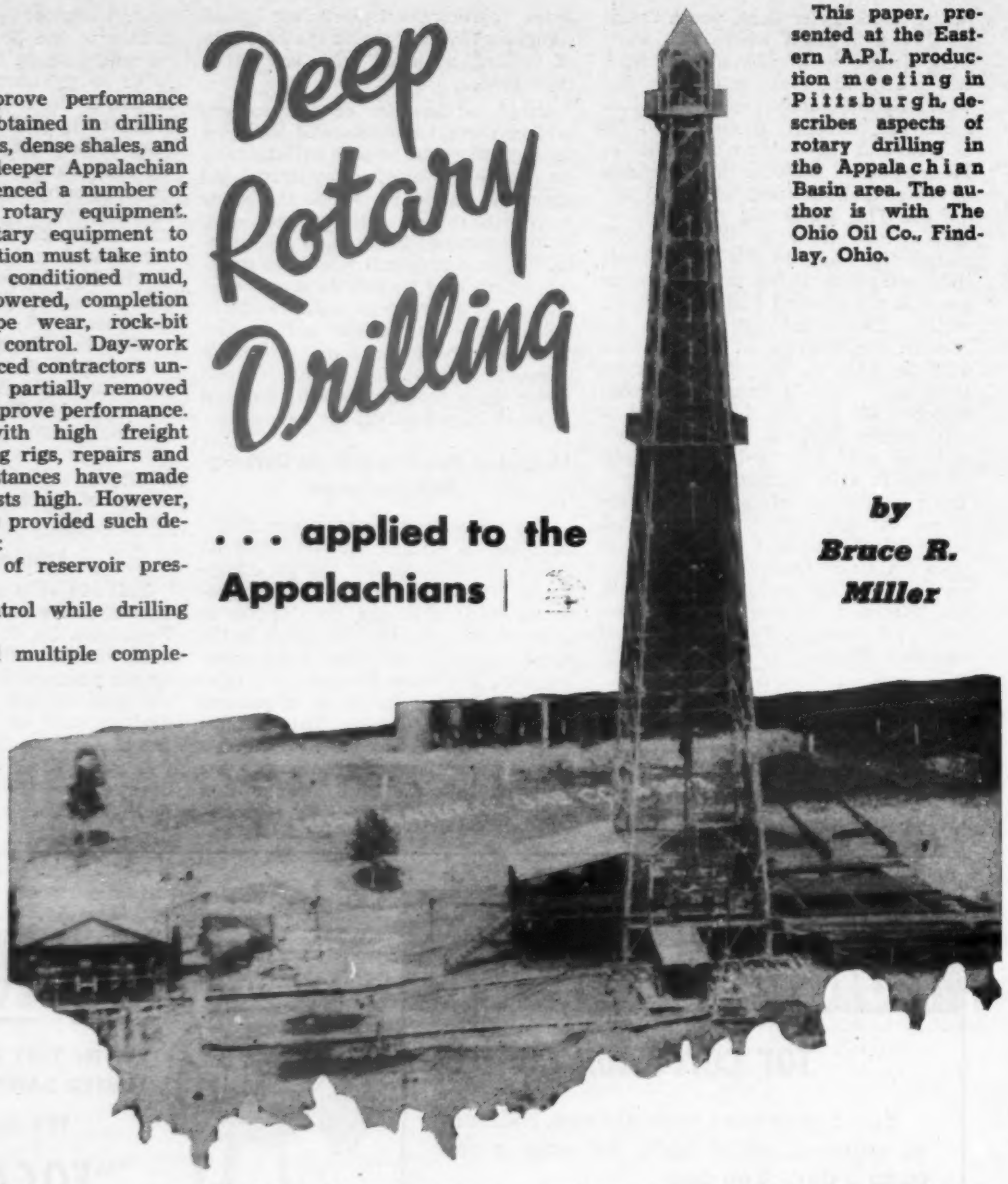
. . . applied to the Appalachians

by Bruce R. Miller

This paper, presented at the Eastern A.P.I. production meeting in Pittsburgh, describes aspects of rotary drilling in the Appalachian Basin area. The author is with The Ohio Oil Co., Findlay, Ohio.

DESIRE to improve performance and results obtained in drilling hard abrasive sands, dense shales, and siltstones of the deeper Appalachian sections has influenced a number of operators to use rotary equipment. Adaptation of rotary equipment to drilling in this section must take into account properly conditioned mud, rigs adequately powered, completion practices, drill-pipe wear, rock-bit footage, and well control. Day-work contracts have placed contractors under restraints and partially removed the incentive to improve performance. These factors with high freight charges for moving rigs, repairs and supplies great distances have made rotary drilling costs high. However, rotary drilling has provided such desirable benefits as:

1. Conservation of reservoir pressures.
2. Complete control while drilling and completing.
3. Selective and multiple completions.



Cable-tool rigs are "standard practice" in the Appalachian area, dating from the Drake well. But with exploration for deeper pays, with higher pressures, some heavy rotary tools entered the territory — such as this one of Falcon-Seaboard Drilling Co. on a Harrison County, West Virginia, operation

4. Saving in casing.
5. Hole size maintained to objective.
6. Reduced drilling time.
7. Eliminate hazards of blowouts and fires.
8. Provide data for reservoir study.

Expanded use of rotary equipment for deep-well drilling in the Appalachian area is indicated and such use will result in a continued decrease in the cost of drilling by the rotary method.

Rig Selection

In the selection of equipment and contractor for drilling of a deep well in the Appalachian area a number of items should be very carefully considered. These items may be enumerated as follows:

1. Size of rig.—The rig should be sufficiently large to make good time in tripping the drill pipe without placing undue overload on draw works, clutch, transmission, chains, and motors. If the rig is powered by gasoline or natural-gas engines the 10 per cent reduction in power that may be developed by these engines at altitudes of 3,000 ft. or better must be considered. A satisfactory rule of thumb as to horsepower required in the Appalachian area is 1,000 hp. for depth below 8,000 ft.

2. Versatility of rig.—The rotation speed of drill pipe and the pump pressure developed should not be limited one by the other. Some of the Appalachian section requires relatively high rotary speeds and pump pressures while other sections require low rotary speeds and high pump pressures. This may be illustrated by tests conducted while drilling the Devonian shale section. Increasing the rotary speed from 65 to 80 r.p.m. and the pump pressure from 750 to 1,000 psi. increased the rate of penetration by 20 per cent. The higher pump pressure and increased rotary speeds could not be maintained for any appreciable length of time as severe overloading of engines resulted. If mechanical failure occurs, the rig under ordinary circumstances should be capable of continued operation until replacement parts can be secured.

3. Availability of repairs.—Selection of power rigs for operations in this area in so far as possible should be confined to equipment and in particular motors and engines for which replacement parts may be secured with a minimum of delay.

4. Supervision. — Supervision, always an important role in any undertaking, is doubly important for operations in the Appalachian region. The needs of all supplies such as mud,

cement, bits, coreheads, reamers, fishing tools, and various oil-field services must be anticipated and arrangements made far in advance of their actual need. Much of the above equipment and service must come from Texas, California, Oklahoma, Illinois, and other states quite distant from the Appalachian area. The supervisor and tool pushers for the Appalachian area should be thoroughly familiar with operations in hard-rock country as well as operations in a locality where lower temperatures and adverse weather conditions are to be encountered.

5. Operating personnel. — Crews should be selected that are accustomed to working under adverse conditions and low temperatures. It is a distinct advantage to have crews that have previously worked on the rig and as much as possible from the same section of the country. Rigging-up technique and procedure varies widely in the various sections of the country and creates much confusion and lost time when the crews are not accustomed to rigging up and maintaining various sections of the rig in the same manner.

Drill Pipe

Drill-pipe wear in the Appalachian area compares quite favorably with that obtained in drilling other hard-rock sections such as encountered in the Rocky Mountain area. Under ordinary circumstances drill pipe may be expected to drill 50,000 ft. of hole. Drill-pipe wear has been found to be greatly accelerated in that portion of any hole which has been drilled by cable tools. This accelerated wear may be attributed to the irregular walls of the hole and the absence of filter cake to cushion and lubricate the drill pipe. Fig. 1 shows a hole survey of a well drilled with cable tools to 7,800 ft. and completed with rotary. A common characteristic for the section drilled with cable tools is the spiral in the counterclockwise direction. Drill-pipe wear is materially increased by the rotation of drill pipe in a conventional clockwise direction through these counterclockwise spirals which the cable-tool hole has assumed. If cable tools are to be used to start holes which are later to be completed by rotary it is essential that the hole be straight and the need of some study on the influencing factor resulting in a counterclockwise spiral of the cable-tool hole is indicated.

The torque in the drill pipe when rotating in holes such as illustrated is much increased as compared with holes drilled by rotary, regardless of the fact that the rotary hole may in some instances assume a course as far from vertical than that of cable-tool hole. The drag of a cable-tool hole on drill pipe frequently increases the torque when the drill pipe is rotated sufficiently to make up the kelly

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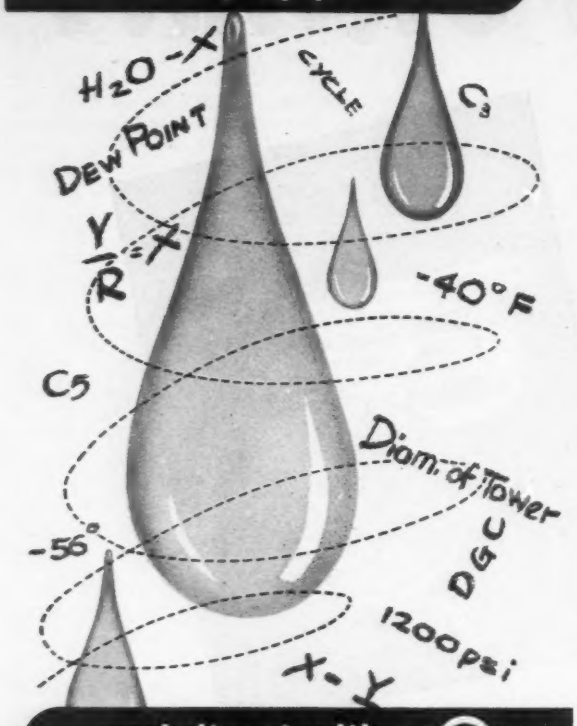

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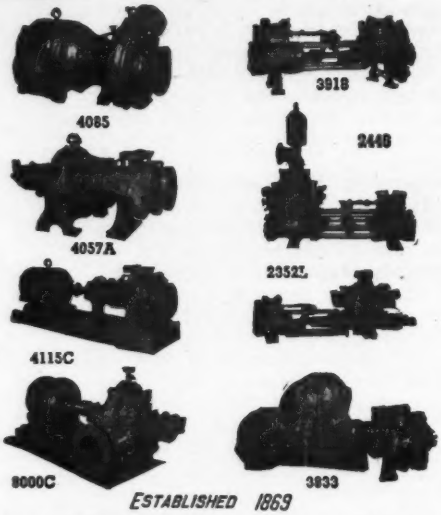

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when the rotary clutch is disengaged after rotating the kelly sub out of the tool-joint box. This drag on the drill pipe has been noted to produce a differential on the weight indicator of 20 points between the weight of the pipe hanging in the hole and the weight when hoisting or lowering the drill pipe. In other words a total of 135,180 lb. difference between the line tension required to hoist or lower the drill pipe. Such a differential makes it very difficult to fish, core, or control accuratly the weight on the bit.

Four and one-half inch, Grade D, 16.6 lb. drill pipe with full-hole tool joints has been found quite satisfactory for drilling the hole for the production string. Once the production string has been set, 3½-in. drill pipe should be utilized in preference to tubing if additional hole is to be drilled or cored. Although wells have been deepened and cored in the Appalachian area by utilizing 2½-in., 6.5-lb., 8-rd. thread, J-55 tubing reduction in rate of penetration with tubing resulting from the necessity of carrying less weight on the bit and the increased time consumed in making trips makes it uneconomical as compared with the service of 3½-in. drill pipe.

If any appreciable amount of hole is to be made below the production string, rubber or synthetic stabilizers should be installed on the drill pipe to prevent extensive wear of the production string and drill pipe by continued and prolonged rotation of the tubing or drill pipe.

Tool-joint wear is high through the very abrasive sand sections of the Appalachian area and 4½-in. tool joints with an outside diameter of 6 or 6¼ in. prolongs the useful life of the joints prior to resleeving or building up, by approximately 25 per cent, and the use of such joints is economically desirable and practical. Tool joints should be calipered regularly and laid down before wear has progressed sufficiently far as to make it impossible to true up the outside diameter of the joint at $5\frac{3}{16}$-in. Large numbers of stabilizers have been utilized on the drill pipe in open hole to minimize the wear on tool joints and drill pipe, however, the short life of these stabilizers when used in the open hole and subsequent cost of continued renewal of the stabilizers leaves the advisability of such practice open to debate.

Rate of penetration has been found more satisfactory when five or more drill collars are employed. These drill collars should have an outside diameter as large as can safely be fished for in the size hole being drilled. It is important that sufficient drill collars be run to keep the drill pipe from whipping the walls of the hole and eliminating the necessity of using any of the drill-pipe weight on the bit. Machine shops with equipment large enough to recut threads on drill collars may be quite distant from the well location and at least four extra drill collars should be available on the rig at all times. Bit reamers where employed have given excellent results in keeping the hole to gage and increasing the footage obtained per bit by eliminating the necessity of reaming down with a new bit.

Bits

Rotary drilling in the Appalachian area is accomplished by the use of rock bits exclusively. Selection of tooth design of rock bits used varies with the formation encountered. Experience obtained in this area indicates that improvement in the bit-cutter bearings is desirable. As a whole it is considered economical to pull bits when the rate of penetration has fallen to one-half the rate obtained with a new bit. The 50 per cent reduced penetration figure is an average figure for the entire hole, and bits may be pulled sooner on hole near the surface due to the short period of time lost in making a trip. Such practice is economically desirable and should be encouraged.

Inspection of bits when pulled indicates cutters to be in fair condition and suitable for continued running; however, in all cases the bearings are worn sufficiently to allow the bit to dig a tight hole. The penetration figures given above may be used as a rough guide; however, in some sections of the Devonian shale it has been found that the rate of penetration is increased once the wire edge has been worn off the bit-cutter teeth. Data gathered indicate that a bit with long teeth on the cutter such as the conventional rock bit used for drilling shale but with the ends of the teeth flat similar to rock bits used in very hard formation or for drilling on junk iron would increase the rate of penetration.

Selection of size bit to use deserves considerable attention. The hole drilled should be the smallest providing sufficient clearance to avoid sticking the drill pipe or casing and allow sufficient clearance for the purpose of fishing. The reduction in hole size should not be carried to extreme as the bearings of larger bits will take more weight for a longer period of time as compared with smaller bits. A reduction in bit size from 12¼ to 10⅝ in. or 1.525 in. in diameter will increase the rate of penetration by 14 per cent without a reduction in footage drilled per bit. A total of 100 bits should be required to drill the average 8,000-ft. hole with an elapsed time for drilling of 160 to 180 days.

Mud for rotary drilling in the Appalachian area as a whole has not

(Continued on page 98)

Cable tools, too, go deep in the East's search for new production. Description of this year's drilling of the world's deepest cable-tool test—scene: Butler County, Pennsylvania—was told in the Journal in the March 30 issue, pages 266-269.

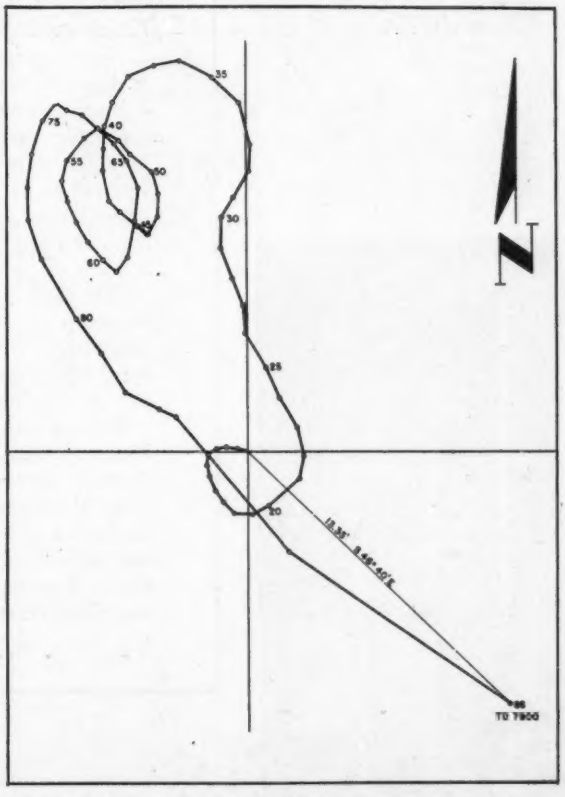

Fig. 1—This is a survey of a 7,800-ft. cable-tool hole in the Eastern area where rotary was moved in for completion. Note counter-clockwise spirals. This introduces several troublesome factors in the later rotary-tool work

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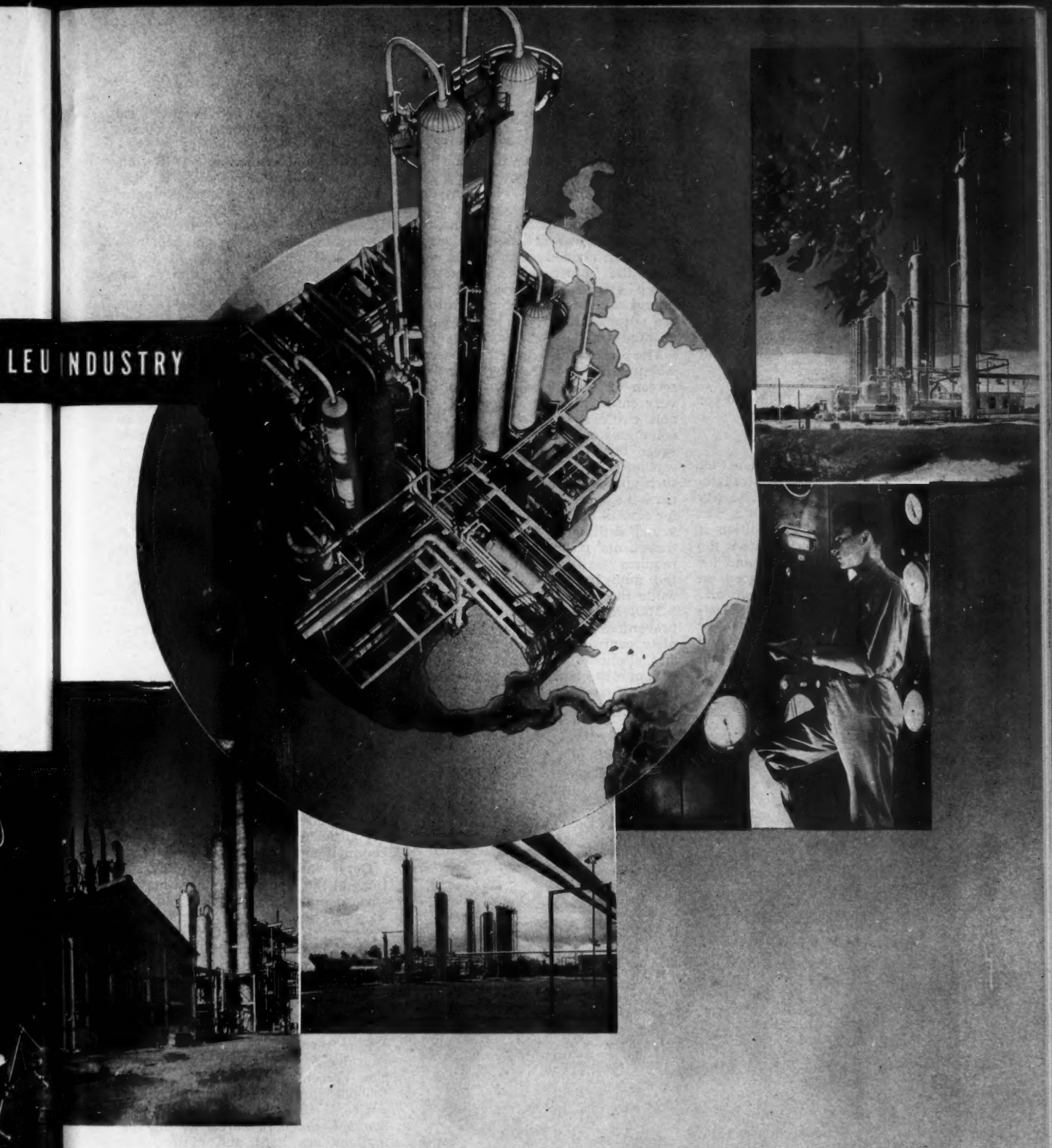

STON PETROLEUM ENGINEERING, INC. TULSA

Photographed for Petroleum Engineering, Inc.
By Robert Yarnall Richie

VOULGARIS

been given sufficient attention. Due to the fact that rotary mud has not been conditioned or tailored to the particular formations of the sections penetrated in deep Appalachian wells has no doubt influenced some operators to condemn rotary drilling in this area as dangerous and impractical. The requirements of a mud satisfactory for drilling the Appalachian section may be enumerated as follows:

1. Low water loss. (Below 6 cc. for a full 30-minute test.)
2. Relatively high jel strength. (10-minute jel of 4 to 5.)
3. Low weight. (10 to 10.5 lb. per gallon.)
4. Low viscosity. (45 to 50 cp.)
5. Low sand content. (Below 10 per cent.)
6. Thin filter cake. (2/32-in.)
7. High pH. (11 to 12.)

The muds made by the hole are high in weight, have zero gel strength, water loss of above 15 cc., viscosity in the vicinity of 60 cp., pH of 8, and filter cake of 3/32 in. The addition of chemicals and water to condition the mud should be added slowly and for this purpose steel drums placed on top of the return mud ditch and equipped with small valves have proven very satisfactory.

Steel mud tanks for handling mud offer many advantages over the old open earthen mud pits. It is conservatively estimated that a savings of 20 tons of mud on an 8,000-ft. hole may be accomplished by the service of steel mud tanks. The ability to exclude surface water from the mud reduces mud treatment from a continuous operation to treatment once in 8 to 24 hours depending upon the size hole being drilled and the rate of penetration. Steel mud tanks provided with flooded pump suction eliminate the 10 per cent reduced mud pump efficiency experienced when pumps operating at high altitudes are required to lift mud from earthen mud pits.

The vibrating-type mud screen when equipped with the proper mesh screen (20 to 30 mesh) have been very satisfactory for removing shale and cuttings from the mud. When conditions permit, much mud may be saved by utilizing water to drill all cement plugs. If the use of water for such purpose is impossible or impractical the mud should be conditioned for cement contamination prior to the actual drilling of the cement. Such treatments prior to drilling cement requires less treatment and maintains the mud in much better condition while the cement is being drilled.

Mud and power-operated blowout preventers give assurance of complete control of high-pressure zones and eliminate the dangers of blowouts and the hazards to property and life by fire.

The cost of mud and chemicals for mud treatment should not exceed $5,000 for an 8,000-ft. well.

Casing and cementing.—Well completions with rotary tools offer several distinct advantages as compared with cable tools. Eight, nine, ten thousand feet or more of large-diameter casing may be run and cemented with ease and safety in a 16 to 24-hour period utilizing rotary and floating equipment. The usual practice is to run a float shoe on the bottom of the casing and a float collar some 30 or 40 ft. above the float shoe. The two floats give insurance that there will be no backflow of mud or cement into the casing and provides an accurate benchmark for positioning the last cement plug. Should conditions warrant, multiple stage cement jobs may be performed at the time the bottom of the pipe is cemented. Multiple-stage cement jobs enable the operator to leave any portion desired behind the casing free of cement.

High bottom-hole temperatures are not encountered in this area and high temperature decomposition of mud or the necessity of retarded set cement is not a factor to be considered. Some retarded set cement has, however, been used to provide an additional safety factor on multiple stage cement jobs.

The service of rotary for deep Appalachian drilling eliminates the necessity of running successive strings of casing to shut off formation waters. Elimination of these casing strings reduces the expenditure for casing and enables the operator to drill a much smaller hole from the surface and at the same time reach the objective formation with a hole of sufficient size that any type of completion may be performed.

Cores and core analysis.—Pay sections in the Appalachian area may be several hundred feet thick and have varying porosity and permeability. To properly evaluate any producing formation the permeability and porosity of the formation is highly important. Permeability and porosity tests may readily be conducted on cores taken with a conventional rotary core barrel.

Core recovery as a whole may be considered very good in this area. The percentage of recovery of the footage cored is in the vicinity of 84 per cent. All coring is conducted with conventional core barrel as the formations are hard and cutter wear severe no advantage would be gathered or time saved from the service of wire line core equipment. The average length core cut per cutter head is 8 ft. Cores may be obtained in any section of the hole which has a rate of penetration with a 10⅝-in. bit of more than 1 ft. in 2 hours.

Electric log.— Coring is expensive and a time-consuming operation and it is desirable to eliminate all unnecessary coring in a field at the

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earliest possible date. The practice of coring key wells only and relying on electric logs for much of the correlation and evaluation work has been used extensively in other areas. Within localized areas a direct comparison between cores and electric logs on key wells together with permeability and porosity determination on the cores and production figures will produce a set of values that may be used very satisfactorily for reservoir study on wells that are not cored but upon which an electric log has been run.

Selective acidization.—Data on the ability of different parts of a thick producing section to produce is necessary if the maximum production is to be obtained from the well and intelligent forecast of future performance of the well is to be made. An example which illustrates the ease with which any number of similar intervals may be tested utilizing rotary and the difficulty of obtaining such information by other methods is as follows:

A pressure of 1,550 psi. was required to pump 4,500 gal. of 15 per cent acid into the lower section of the Oriskany sand. Pressures of 2,000-2,050 psi. were required to pump acid into the upper sections of the Oriskany sand. Each of the referred-to sections was tested, acidized, and again tested exclusive of other productive zones in the hole.

The increased pressure necessary to pump acid into the upper sections of the Oriskany as compared with the pressure required to pump acid into the lower section would make it impossible to effectively acidize the entire producing zone should these zones be exposed to acid simultaneously in the open hole. A 1,900 psi. pressure was necessary to reacidize the Oriskany sand with 8,700 gal. of 10 per cent acid (4,150,000 cu. ft. per day) after killing the well with rotary mud and perforating and testing a section of the Devonian shale. The mud utilized to kill the well prior to the test conducted on the Devonian shale had a water loss of slightly over 12 cc. for a full 30-minute test. This high water loss coupled with the difficulty of building a filter cake on the walls of the hole after it has been subjected to acid substantiates the necessity of maintaining a low-water-loss mud. In instances where it is found necessary to kill a well after acidization the services of oil-base or salt-water mud may be preferable to conventional mud. Fresh water in some instances does not produce sufficient hydrostatic head to completely kill the well.

Acknowledgments

For permission to use data on rotary drilling the author is indebted to Dr. W. B. Emery, vice president and manager of producing; the help and suggestions of F. E. Smith, general superintendent of production; and W. H. Barlow, petroleum engineer for The Ohio Oil Co., is acknowledged.

BOOKS

COLLOID CHEMISTRY. Vol. 6. Edited by Jerome Alexander. Reinhold Publishing Corp., 330 West 42nd St., New York City. 1,215 pp. $20.

This sixth volume of the monumental work covering the principles and practices of colloid chemistry, specific industries, and synthetic polymers and plastics includes in its list of chapters those on the mass spectrometer, the Geiger-Muller X-ray spectrometer; catalysis and its industrial applications; chemistry of insecticides; electrical precipitation of suspended particles in gases; synthetic rubber, soil stabilization and drilling fluids, and several other subjects. In all, 38 chapters are included in this division of the volume. In discussing synthetic polymers and plastics the various alkylcelluloses are presented; polystyrene, the phenolic and coumarone-indene and other resins, silicones, soybean plastics and practically the whole gamut of these products, the chemistry of which is not yet fully known. The molecular structure is discussed for most of these materials, and the industrial and commercial significance of each is presented concisely. Literature references for each chapter are numerous and exhaustive, covering the field with fair completeness.

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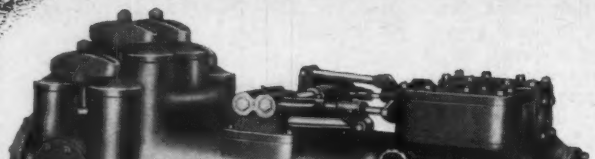

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Radar

(Continued from page 75)

veying a line from, say, Chicago to Kansas City to Amarillo in only two jumps can be imagined. For a survey of that route, three ground stations would be used, one at each of the three cities, and 10 or 20 flights back and forth across the approximate center of each line would be required.

Except for one consideration, it would be unnecessary for any individual to set foot upon the intervening terrain. For first order accuracy survey work, to allow for the effect of climatic conditions on propagation velocity and on the refraction of the radio waves between plane and ground, sounding balloon or other types of atmospheric determinations along the path are necessary.

Nevertheless, the simplicity and rapidity with which unmapped portions of the earth can be brought into survey control with equipment of this type is little short of amazing.

Fig. 1 shows the two-distance "fix" method used by Shoran to locate a position in flight. The airplane equipment transmits a series of short pulses of radio frequency energy to each of a pair of ground stations. These in turn immediately retransmit the received signals back to the plane, where the round-trip time is measured in terms of distance.

In operation the plane flies in either direction on an arc about one of the ground stations. The radius of the arc is equal to the station-to-target distance. Since either ground station may be used as the center of the flight path, four approach headings toward a target are possible.

With normal station-to-target distances, the curvature of the target-run path is relatively slight. A refined type of pilot direction indicator meter makes it possible to keep the plane on its arc path with deviations less than the span of the plane wings.

If the geographic locations of the ground stations, as well as those of all possible targets are accurately known, the geodetic problems connected with Shoran operations are relatively simple of solution. When the exact locations of targets are not known, Shoran reconnaissance photography will reveal their coordinates.

The ruggedness and relative simplicity of operation of a Shoran system, together with the freedom from equipment failures in combat use, are all remarkable in view of the extreme precision of the results obtained.

The Plane Equipment

Figs. 2 and 3 show the principal units of the Shoran plane equipment. Fig. 2 shows the timing and indicating device which is the most vital part of the system. This unit permits regulation of the timing of the transmitted pulses in such manner that the signal returned by retransmission from the ground arrives back at the plane receiver and makes its appearance on the cathode-ray screen coincidentally with the fixed, or so-called t_0 marker indication. The adjustment necessary to effect this coincidence is calibrated in miles and decimal portions, and the mileage indications are read from the dial settings.

The pulse-timing function is duplicated in the indicator unit to allow for simultaneous distance measurements from two ground stations. Fig. 2 shows the two large 100-mile dials at the bottom of the panel. At the left of each dial is a Veeder-type counter, the three digits of which indicate miles, tenths of a mile, and hundredths of a mile. Estimation for the nearest one one-thousandth of a mile is possible.

It is possible to operate many planes in the air at once and have them all use the same pair of ground stations. This is accomplished by an adjustment in the commutator that makes it impossible for two plane equipments interrogating a common ground station to stay synchronized for more than a small fraction of a second, in spite of the fact that their interrogation rates are precisely the same.

The trace on the cathode ray tube is circular. A throw of a switch changes the deflection rate from a 1 to a 10, to a 100-mile scale. For navigational purposes, out to the initial point of a target run, the 100-mile scale is adequate. All traces on the oscilloscope are blanked out when using the 1 or 10-mile scales, except for the particular 1 or 10-mile interval containing the T_0 time.

The plane receiver controls are on the separate oblong panel extending upward slightly to the right of center in Fig. 2. The receiver can be withdrawn and replaced in a matter of only a few seconds in case of defective operation. All connections, with the exception of the antenna, are made through sliding contacts and are thus automatically broken and reestablished when the unit is removed and replaced. Fig. 4 shows a receiver withdrawn from its compartment.

Fig. 3 shows the plane transmitter which generates the signals radiated under control of the timing and indicating unit. It is usually mounted in some out-of-the-way position in the plane, since there are no adjustments that need attention while in flight.

The antenna for radiating the transmitter power is of the stub type and is mounted vertically either above or below the fuselage. The antenna proper is somewhat unconventional and consists of a center rod extending approximately one-eighth wave length beyond a one-eighth wave grounded, concentric sleeve. The entire assembly is about 12 in. in length. In operation the antenna has relatively broad band characteristics and produces a low order of standing wave ratios on the 50-ohm transmission feed line throughout the transmitter frequency range.

The plane receiving antenna is of the same type construction, but is somewhat shorter in over-all length, since it receives signals from the ground stations, which transmit on approximately 310 megacycles.

Lengths of interconnecting cables between units and between the transmitter and receiver and their respective antennas have an effect on the total time spent by pulse energy in traversing all of the plane equipment circuits. Therefore each plane installation must be compensated by a process which involves sending of test signals around the complete loop and making the necessary corrections in the position of the marker pulse.

The Ground Station Equipment

A ground installation (see Fig. 1) consists essentially of four principal units. These are the receiver-monitor, the transmitter, the antenna arrays, and the gas-driven power supply. The complete equipment is air transportable and can be flown to a known location and put into operation within 90 minutes after arrival.

The primary function of the ground equipment is to receive, reshape, and retransmit all pulses arriving at the location on the particular wave length to which the receiver is tuned. (See Fig. 1). The elapsed time between the arrival of a signal at the receiving antenna and the radiation of the resultant pulse from the transmitting antenna must be accurately adjusted to a fixed standard time interval. That adjustment, as well as others necessary for proper operation of the installation, is performed with the aid of the monitor portion of the monitor-receiver unit. (See Figs. 1 and 5).

The receiver, shown on the right-hand side in Fig. 5, is identical to and interchangeable with the receiver in a plane. (See Fig. 4). It has a continuously adjustable tuning range between 210 and 320 megacycles.

The transmitter, shown in Figs. 1 and 6, is very similar to that used in a plane. However, when serving a larger number of planes, it has a much higher duty cycle, and the modulator circuits are therefore made heavier to handle that load. While the average plate power in a plane transmitter is 30 watts during operation, the ground transmitter may be developing as much as 400 watts.

The transmitting and receiving antennas are shown in Fig. 1. The reflectors give power gain of approximately 8 to 1 in the forward direction, with a horizontal coverage angle of about 70° to the half-power points. The whole assembly is supported on a 50-ft. sectionalized plywood mast. The gas-driven generator delivers about 1,500 watts at 115 volts, 400 cycles, and approximately 400 watts at 28 volts direct current.

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QUESTIONS on TECHNOLOGY

by W. L. Nelson
Consulting Engineer

Volume of Oil and Gasoline Vapors

What is a rough approximation of the volume that a gallon of oil will occupy when it is vaporized? We are familiar with the volumes of hydrocarbons but do not know about refinery vapors.—R. P. G.

Only a gross approximation can be given because the volume depends upon the temperature and pressure, and of course, the oil must always be at a temperature sufficiently high to cause it to vaporize.

With respect to pure hydrocarbons or the common mixtures of them encountered in the natural gasoline industry, the volumes at 60° F. and at atmospheric pressure (2nd Ed. Petroleum Refinery Engineering, McGraw-Hill Book Co., New York) are somewhat as shown in Table 1.

The figures for pentanes, hexanes, etc., that boil above 60° F. are somewhat hypothetical, but they are useful in handling these materials in mixtures that are so dilute or lean that these materials can exist in the gaseous state at 60° F.

TABLE 1 — VOLUMES OF NATURAL GASOLINE HYDROCARBONS PER GALLON OF LIQUID

	Cu. ft. per gal. at 60° F., 14.7 psia.	Gal. per M.c.f.
Ethane	39.7	25.2
Propane	36.5	27.4
Isobutane	30.8	32.4
Butane	31.6	31.6
Pentanes	27.4	36.4
Hexane	24.3	41.1
Heptane	21.6	46.4
Octane	19.5	51.4
Pentanes and heavier	24.1	41.5
Hexanes and heavier	22.1	45.0

TABLE 2—ESTIMATED VOLUMES OF UNSATURATED GASES PER GALLON

	Pounds per gal. at 60° F.	Cu. ft. per gal. at 60° F., 14.7 psia.	Gal. per M.c.f.
Ethene (ethylene)	3.2	43.4	23.0
Propene	4.3	38.8	25.8
Isobutene	5.0	33.8	29.6
Butene-1	5.0	33.8	29.6

Data on the unsaturated gases cannot be given with great assurance because they must be computed from general laws rather than experimental records. The method employed in computing Table 2 involved assuming that the pound molecular volume is 379.4 cu. ft. at 60° F. and 14.7 psia., and estimating the specific gravity of the liquid at 60° F.

With respect to refinery liquids and vapors it is also necessary to make the assumptions indicated above and in addition to use approximate molecular weights and gravities. Table 3 shows vapor volumes at 60° F. (hypothetical or useful only for weight balance computations) and vapor volumes at common complete vaporization temperatures.

The reason that data such as those shown in Table 3 are not common knowledge is the fact that such data are not needed by refinery engineers. Conditions are always specific and hence such data are seldom satisfactory and in fact the data can be computed more easily than to remember or look up. It would seem that a gross idea of gasoline volumes at common refinery conditions might be taken as 30 cu. ft. per gallon of liquid.

For purposes of weight balances or as a starting point for estimating vapor volumes, the data shown in Fig. 1 may be useful. Note, however, that the vapor volumes are shown for 60° F. and 14.7 psia. and hence they will usually need to be corrected to the actual temperature and pressure.

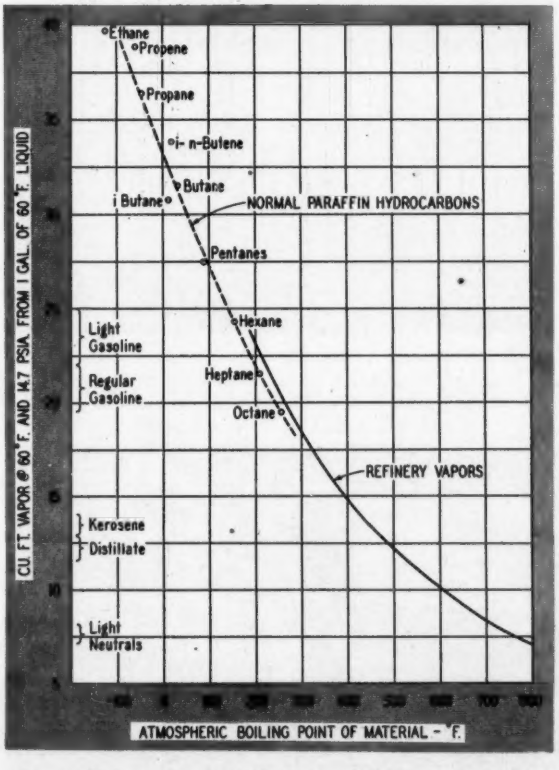


Fig. 1—Volume of vapor (60° F. and 14.7 psia.) from 1 gal. (60° F.) of liquid

TABLE 3—APPROXIMATE VOLUMES OF REFINERY VAPORS PER GALLON OF 60° F. LIQUID

		Cu. ft. per gal., 60° F. Liquid	
	A.P.I.	60° F. and 14.7 psia.	Common temps. and 14.7 psia.
Light gaso.	55-70	22-25	29.4-33.4 @ 230°F.
Reg. gaso.	50-65	19.6-22	29.0-33.2 @ 300°F.
Kerosene	40-48	12.9-14.1	22.6-25 @ 450°F.
Distillate	30-40	11.6-13.0	21.4-24 @ 500°F.
Light neut.	25-33	7.2- 8.2	....

Cost and Application of Finned Tube Exchangers

We feel that the statement in The Refiner's Notebook No. 81 of February 16 that, "Their main disadvantage is the high cost caused by the relatively large area of shell that must be purchased," is in part misleading and trust you will be interested in the comment which we offer in a most friendly manner.—W. E. B.

The position of W.E.B. is well taken. Fundamentally it is true that the relative proportion of shell in double pipe or similar equipment is large compared to shell-and-tube-bundle equipment, but it does not follow that the cost of a fin-tube double-pipe equipment such as the American Locomotive Co. equipment shown in The Refiner's Notebook No. 81 is greater than the cost of other equipment for the same job of heat exchange.

W.E.B. comments: "Certain factors affecting cost are standardization and production in quantity. In addition, these units are thermally engineered so that their selection for a specific application is a very simple matter. Contrast this with the usual custom of involved thermal engineering, the preparation of special drawings and the manufacture of one unit at a time to meet a custom-tailored design. In some instances you can well understand the engineering cost may even exceed the cost of the equipment itself (particularly in small installations. Ed.). In practice we find that these standard units fill many

applications and surprisingly even those applications which theoretically do not justify fin tubing. In addition, these units are designed for 500 psi. maximum working pressure and yet can be justifiably sold for low pressure applications when necessary. . . ."

Although no actual price figures are given by W.E.B. it can be stated that fin-tube double-pipe or similar equipment is competitive in price with shell-and-tube-bundle equipment, the decision resting largely with the size of the installation and the degree of custom tailoring involved in the design of the shell-and-tube-bundle equipment. It is the belief of this department that an increased use of finned-tube double-pipe and related equipments is economically feasible.

Plant Practices

Mobile Scaffold Eliminates Injuries and Saves Man Hours in Tank Painting

A NEW type mobile scaffold, developed by paint shop supervisors and engineers of Magnolia Petroleum Co.'s Beaumont refinery, has eliminated scaffold injuries and caused a 40 per cent reduction in the man hours required for tank painting at the refinery. It may be used for painting or repairing any structure with a roof angle of less than 20 per cent.

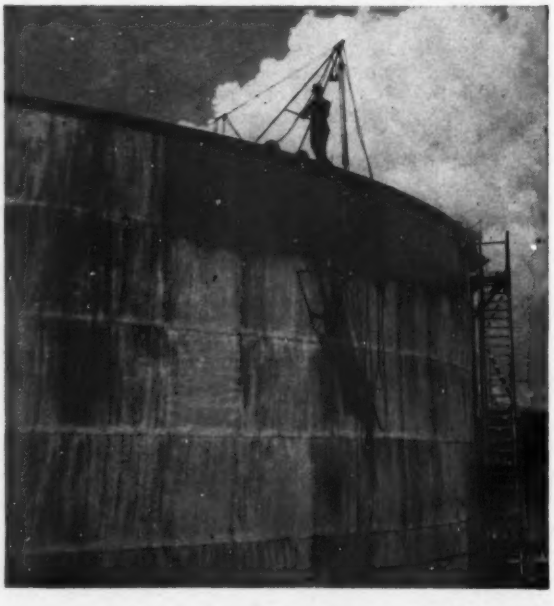
Termed the "traveler scaffold," the device was originally planned as a safety measure after accidents on the conventional shelf scaffold were found to be avoidable. Its savings value has since been proved.

The scaffold is unique in its mobility, the feature that has effected the labor saving. It is built on a modified A-frame, 14 ft. long, with two sets of 12 and 4-in. wheels mounted at right angles to the frame. Apex of the "A" is weighted heavily and anchored to a projection in the center of the tank roof. A boom extends over the roof's edge and supports the painter's chair.

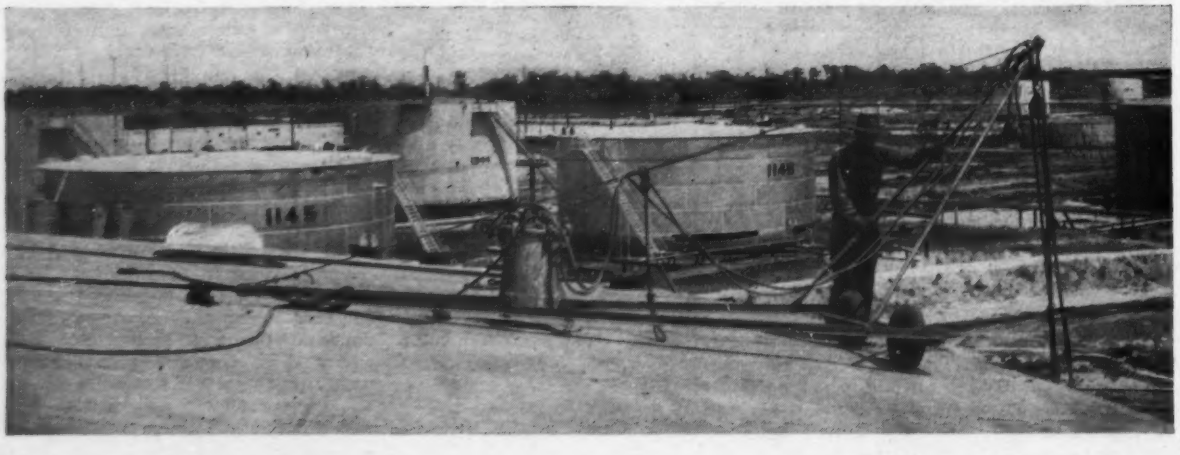
By installing metal center pins on the tank roof the scaffold frame can be anchored by line or sleeve coupling to permit it to roll in a complete circle around the roof. It may then be made fully mobile by mounting an air tugger to the forward wheels or by placing a compressed-air engine on the wheels with control lines running to the chair. Using this last method, vertical and horizontal movement of the chair can be controlled by the painter. If desired, it may be moved manually by the painter's assistant; it was during use of this method that the 40 per cent saving was measured.

For safety the chair principle is used. Heavy armrests protect against a side fall, and an extension of the legs forms a footrest that presses against the tank shell and prohibits a forward fall. When necessary, safety belts may be used.

Designed for greater comfort and easy access to the structure's surface, the scaffold greatly decreases worker fatigue.



Right: Painter's chair in use. Note how forward placement of block lines forces base of chair against tank. Below: Boom trolley for scaffold being rotated by hand



Frank Hopwood, former president of Asiatic Petroleum Corp. and Caribbean Petroleum Co., has been named managing director of the major operating companies of the Royal Dutch Shell group. He succeeds **Sir Frederick Godber,** who becomes chairman of Shell Transport & Trading Co., Ltd.

Engineering Fundamentals

No. 242

A FEATURE OF THE OIL AND GAS JOURNAL

Principle of Stadia and Stadia Surveying

THE stadia method of surveying permits one to determine the horizontal length of a line without the necessity for the surveyor to actually move along the line. Under certain circumstances, such as along steep slopes, or in wooded areas where sights can be made above the underbrush, the results are even much more accurate than could be attained by the usual method of horizontal measurements, and much time is generally saved. This is true also for surveys made in fairly open country provided the accuracy required is such that it will permit the use of the stadia method. Generally speaking horizontal distances can be measured with a ratio of precision of 1 part in 1,000 or better. Where surveys are run carefully the method may be as accurate as 1 part in 2,000. Also, as mentioned in a previous article, stadia measurements can be used to determine difference in elevation between points.

General Principles

The stadia method is based upon the principle of intercept. All transits which are used for stadia surveying have three horizontal crosshairs. The two outside wires, placed equidistant on either side of the central horizontal hair, are known as stadia hairs (Fig. 1). They are so placed by the manufacturer that when a rod held 100 ft. in front of the principal focus of the instrument is viewed through the telescope along a horizontal line of sight, the stadia hairs "a" and "b" will intercept 1 ft. on the rod.

Fig. 2 shows simply the optical principles of the stadia method for a horizontal sight. Although horizontal sights are the exception rather than the rule in stadia surveying this is the easiest condition to assume in starting a discussion of the principle of stadia. For purposes of clarity the sketch is not drawn to scale.

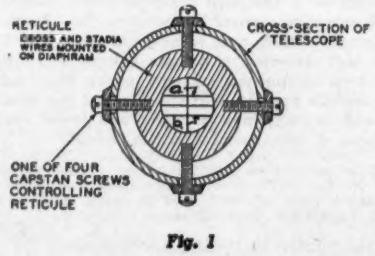

RETICULE
CROSS AND STADIA WIRES MOUNTED ON DIAPHRAM
CROSS-SECTION OF TELESCOPE
ONE OF FOUR CAPSTAN SCREWS CONTROLLING RETICULE

Fig. 1

Suppose it is the horizontal distance, D, from point X to point Y that is desired. The instrument is set up over point X and the stadia rod is held vertically by the rodman at point Y. A horizontal sight is taken on the stadia rod at Y and the readings A and B are recorded. The difference between the two rod readings is computed, and called the "stadia intercept" or "s," i.e., s = A − B. An infinite number of rays of light start from A and B but only two from each point are indicated in the sketch. One ray of light which starts from A passes through the optical center of the objective lens and O continues on to "a" in the plane of the lower crosshair. Another ray from A passes through the point of the principal focus, F, is refracted by the lens at "a'," and is also brought to a focus at "a." Two similar rays which start at B are brought to a focus at "b," in the plane of the upper crosshair. The distance between the two stadia wires is usually fixed by the manufacturer and is indicated by "i." Since bb' is parallel to aa' it follows that a'b' = ab = i. The two triangles b'Fa' and AFB are similar. If "d" equals the horizontal distance from the point of the principal focus to the rod, and "f" equals the focal length of the objective lens, which is equal to the distance from the center of the objective lens to the point of principal focus, the following proportionality may be written:

$$\frac{d}{s} = \frac{f}{i}$$

or

$$d = \frac{f}{i} \times s \qquad (1)$$

The ratio of f/i for any instrument is a constant and is usually designated by K. The manufacturer can control its value since it is he who places the crosshairs "i" distance apart. For convenience K is usually made equal to 100 and it may be used as such for most instruments on ordinary surveys.

Hence, Equation 1 above can be written:

$$d = K \times s \qquad (2)$$

By again referring to Fig. 2 it is seen that:

$$D = d + (f + c) \qquad (3)$$

hence

$$D = K \times s + (f + c) \qquad (4)$$

For all external focusing instruments the quantity (f + c) may be taken as 1 ft. Fig. 2 shows the optics for an external focusing instrument. For internal focusing instruments the quantity (f + c) may be disregarded.

Example.—Suppose that for conditions represented in Fig. 2 the lower reading, B, is 2.00 ft. and the upper reading, A, is 7.72 ft., hence the stadia intercept "s" is 7.72 — 2.00, or 5.72 ft. Assume the usual value of (f + c) as 1 ft. and K = 100. Substituting in Equation 4 the horizontal distance from X to Y is:

$$D = 100 \times 5.72 + 1$$

or

$$D = 573 \text{ ft.}$$

Suppose that the intercept value of 5.72 ft. as in the illustration above was measured with an internally focusing instrument. The point of principal focus, F, in Fig. 2 would fall approximately at the center of the instrument; hence the quantity (f + c) is zero, or nearly so. In this case the horizontal distance from X to Y is:

$$D = 100 \times 5.72 + 0$$

or

$$D = 572 \text{ ft.}$$

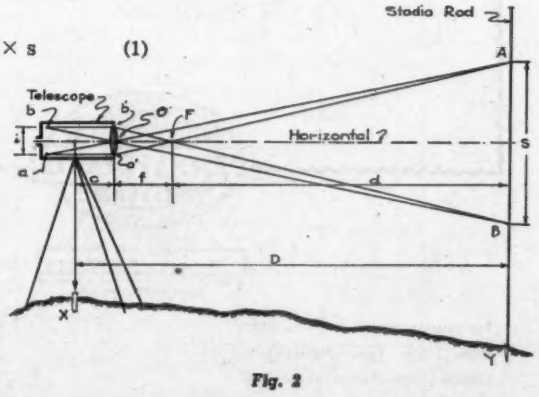


Fig. 2

Series prepared by Dr. E. A. Stephenson, head of petroleum engineering school, and Prof. D. Don Haines, department of civil engineering, University of Kansas

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has been a steady SALES-BUILDER through the years

Jobbers and dealers alike long have profited by the sales-value of the emblem of the Pennsylvania Grade Crude Oil Association. It has been, it always will be, a steady builder of business in lubricating oil.

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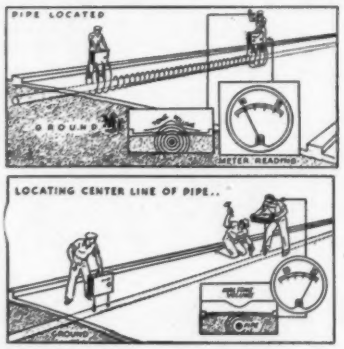

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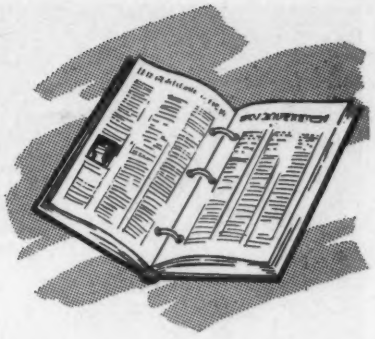
The Refiner's Notebook

A WEEKLY FEATURE OF THE OIL AND GAS JOURNAL



Viscosity Blending Chart

TENTATIVE SCHEDULE OF TOPICS

In recent Notebooks some of the mechanical features of exchangers have been discussed:

No. 77—Jan. 19, Shell and Tube Passes in Exchangers
No. 80—Feb. 9, Types of Exchangers—Shell and Tube
No. 81—Feb. 16, Types of Exchangers—Double Pipe
No. 83—Mar. 2, Routing of Fluids
No. 84—Mar. 9, Shells and Baffles
No. 86—Mar. 23, Exchanger Tubes
No. 87—Apr. 6, Standard Exchanger Tubes

Topics now in process are as follows:

No. 96—Over-all Transfer Rates
No. 97—Pressure Drop Through Exchanger Tubes
No. 98—Pressure Drop Through Tube Bundle of Exchanger
No. 99—Fin-tube Exchanger Rates
No. 100—Viscosity Blending Chart
No. 101—Water Cooled Condensers and Coolers
No. 102—Shell-Still Heaters
No. 103—Design of a Heat Exchanger
No. 104—Viscosity Conversions

THE accompanying chart may be used to estimate the viscosity of blends of oils. Blends of high-viscosity paraffin-base oil with low-viscosity naphthene-base oils, have higher viscosities than the chart indicates, and vice versa.

Example.—An oil of 40 seconds Universal Saybolt viscosity is to be blended with another oil whose viscosity is 200 at 210° F. for the purpose of making an 82-viscosity blend. The dotted line on diagram shows that about 63 per cent heavy oil is required. As further illustrations, a 50-50 blend would have a viscosity of 65, or a blend of 10 per cent heavy oil would have a viscosity of 42.7. The chart would have been used in exactly the same way if the viscosity of both of the oils were taken at 100° F. or any other temperature.

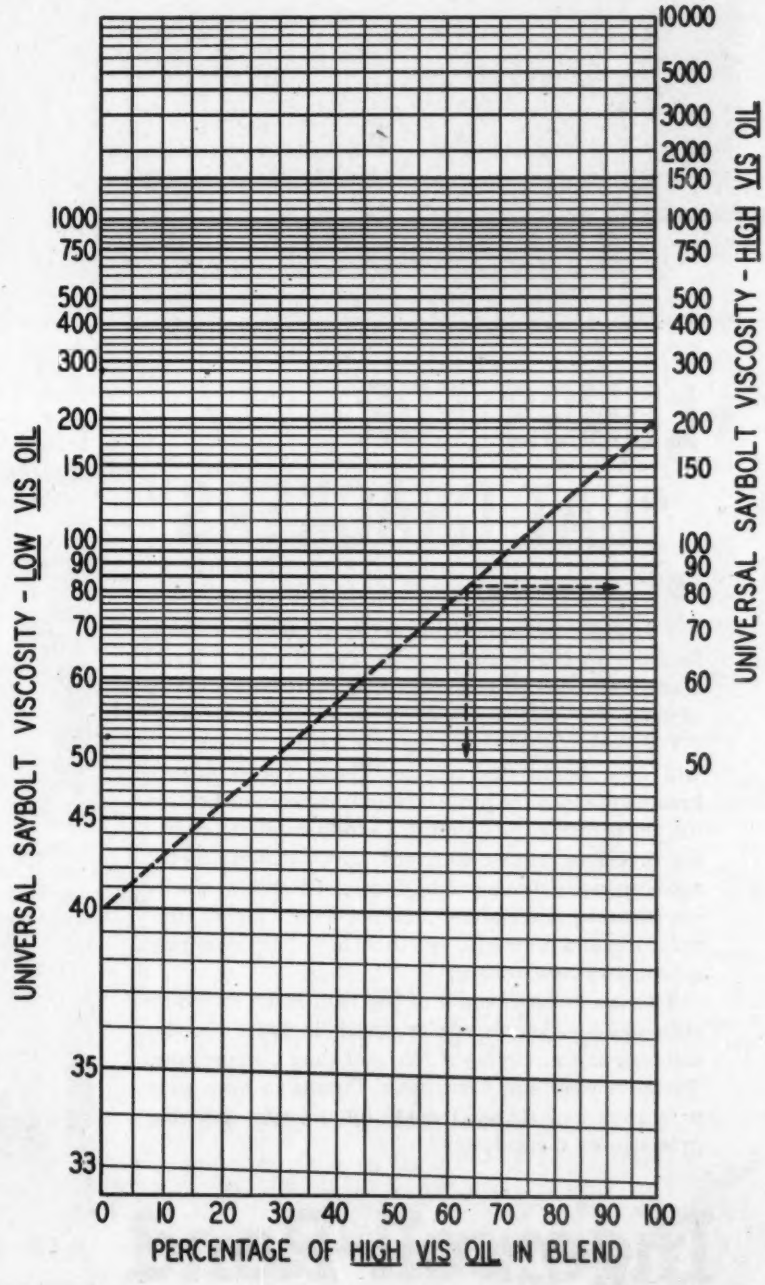


Fig. 1—Viscosity blending chart. (Note: the viscosity must be at the same temperature for both oils)

No. 100 in a series by W. L. Nelson, professor of petroleum refinery engineering, University of Tulsa

LUNGS FOR "CAT-CRACKERS"

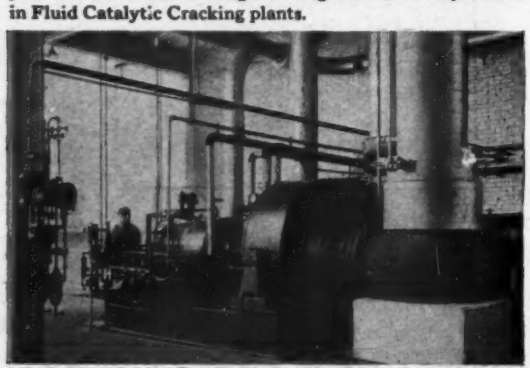
THE PHENOMENAL EXPANSION of catalytic cracking facilities for 100-octane gasoline found Ingersoll-Rand ready with developed and proven Turbo-blowers. Many of these are now in service... more are on the way. I-R Turbo-blowers totaling over 100,000 horsepower, will soon be in this service. These Turbo-blowers breathe life into the process, supplying combustion air for regenerating the catalyst. Certain catalytic cracking processes require standard Turbo-blowers of the type originally developed by Ingersoll-Rand for smelters, furnaces, and agitation; others involve higher temperatures and pressures, and these have been promptly solved with new designs.

This is another example of Ingersoll-Rand service to refineries — a unique service which includes the developing and supplying of Reciprocating Compressors, Turbo-blowers and Centrifugal Pumps to keep pace with each new demand made by the ever-changing processes of the industry.

Ingersoll-Rand

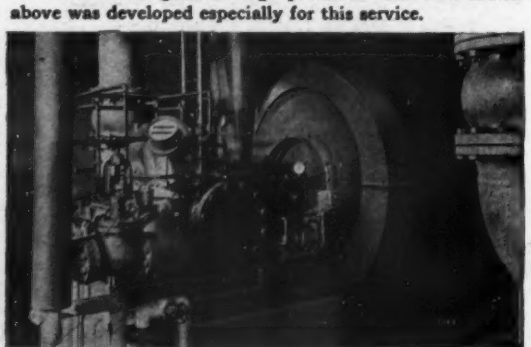
11 Broadway, New York 4, N. Y. 12-748

AIR BLOWER—FLUID CATALYST This 4300-hp turbine-driven blower supplies combustion air for regenerating the dust catalyst used in Fluid Catalytic Cracking plants.



HOT GAS RECIRCULATOR

Certain catalytic cracking processes require the recirculation of hot flue gases at high pressures. The unit shown above was developed especially for this service.



AIR BLOWER—T.C.C. This turbine-driven blower supplies combustion air for regenerating the bead catalyst used in Thermofor Catalytic Cracking plants.

OIL AND GAS EQUIPMENT Digest

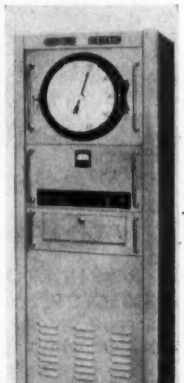
IT'S NEW CHECK IT

by Kenneth B. Barnes

(1) OXYGEN RECORDER is a new automatic continuous analyzer for oxygen content of a gaseous mixture. Provides an instant graphic analysis, is responsive to changes of 0.05 per cent oxygen with sustained accuracy to within 0.25 per cent. Permits close regulation of fuel-air ratios in furnaces, especially where multiple fuels are used or where firing rates change rapidly; results in increased economy and decreased furnace maintenance. Successfully applied to many types of oil and gas processes. *Bailey Meter Co.*

IT'S NEW CHECK IT

(2) NEW DEWPOINT RECORDER continuously and automatically records the humidity of gases. It is a combination of heater, refrigerator, mirror, and gas chamber. The test gas enters the gas chamber and comes in contact with a metal mirror. The refrigerator and heater cool or heat the mirror until a temperature is attained at which moisture in the gas forms dew on the mirror. A photoelectric eye watches the mirror, and the mirror temperature is recorded on a graph the moment dew forms. Working in coordination, the refrigerator and heater hold this dew point temperature within a tolerance of 2° for continuous chart readings. Dew point temperature recorded can then be converted into the moisture content of the gas if desired. *General Electric Co.*



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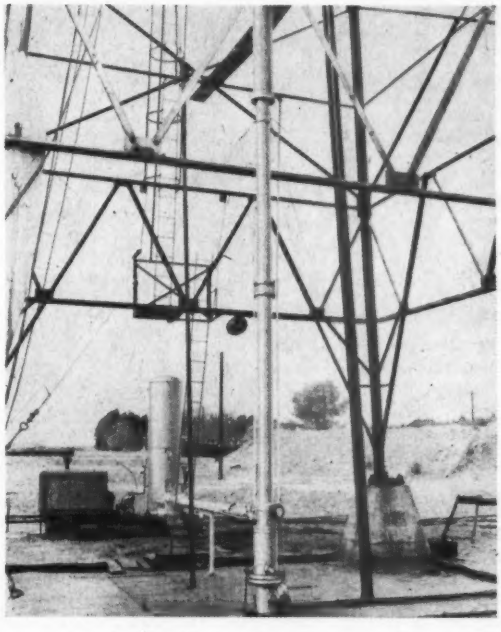

(3) LONG-STROKE HYDRAULIC JACK has important basic improvements in deep oil-pumping equipment. (A) The hydraulic pump supplies oil for moving the operating piston, under control of a reversing valve located in the pump housing. This pump, in combination with the balancing tank, delivers oil to the hydraulic cylinder during the upstroke and takes it away during the downstroke. (B) The hydraulic cylinder consists of a long polished tube with operating piston and polished rod. It is mounted on the casing head and connects to the sucker rods. (C) The balancing tank is under controlled hydro-pneumatic pressure to provide nearly constant input power during the complete operating cycle. The jack

The Oil and Gas Equipment Digest presents a review of what is new in equipment and trade literature . . . makes it possible for readers to obtain full information on every subject by use of convenient "Check It—Mail It" service card. This periodic feature of The Oil and Gas Journal will include all that is new in equipment . . . at a time when new products are being introduced, and existing products improved.

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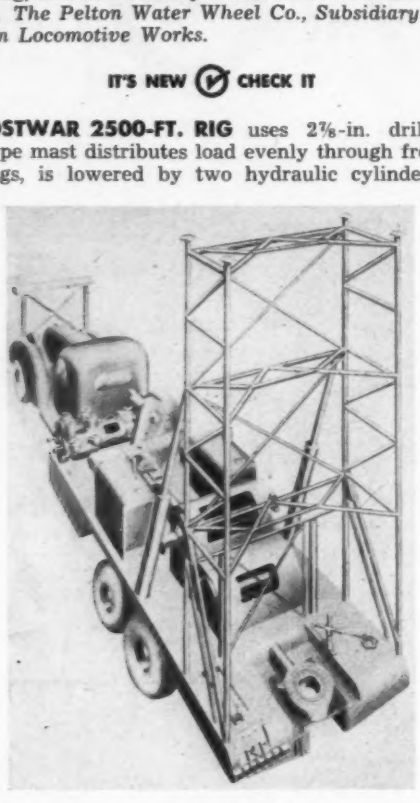
OIL AND GAS EQUIPMENT Digest — IT'S NEW — CHECK IT

gives long, constant-velocity stroke and minimum rod reversals. *The Pelton Water Wheel Co., Subsidiary of The Baldwin Locomotive Works.*

IT'S NEW — CHECK IT

(4) POSTWAR 2500-FT. RIG uses 2⅞-in. drill pipe. New-type mast distributes load evenly through front and rear legs, is lowered by two hydraulic cylinders, and

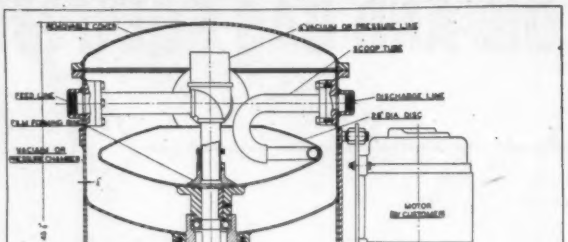


sectionized for a 10-ft. addition. All-steel oil-bath rotary table absorbs severe loads, has helical gears to insure strength and smooth operation. Double draw works actuated by two air clutches. Equipped with dual engines, tied into a hydraulic cushion drive and floating suspension gear box. Hydraulic throttles synchronize motors when compounded. *George E. Failing Supply Co.*

IT'S NEW — CHECK IT

(5) PNEUMATIC PIPE WIPER has a center portion that fits around the drill pipe. This member is a thick-walled, low-pressure air cell with a self-sealing valve. When wear occurs in the pipe aperture, air is added to compensate. This air-cushioned oil-resistant rubber absorbs shocks like a low-pressure tire and gives many miles of clean wiping service. Expands readily when passing tool joints or protectors. *Bettis Rubber Co.*

(6) VERSATOR CORNELL MACHINE reduces centrifugally any flowable material to a micro- or monoparticle film. Consists of a vacuum or pressure chamber in which



a 26-in. open bowl operates at high speed. Centrifugal force flows the material out radially in spirals which reach minimum thickness and maximum velocity at the perimeter. Result is a highly turbulent film which is virtually "all surface" for the application of vacuum or pressure, heat or cold. For homogenizing, emulsifying, reversing emulsions, dispersing solids in liquid vehicles, degassing or deaerating solutions; evaporating and dehydrating without thermal decomposition; for oxidations or continuous hydrogenations. *The Cornell Machine Co.*

IT'S NEW — CHECK IT

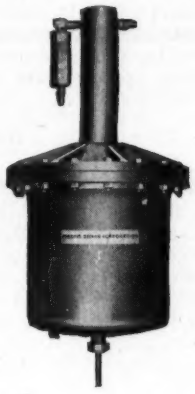
(7) NEOPRENE-COATED CANVAS GLOVES are made of milled neoprene, which provides tough coating for resistance to abrasion and other wear hazards. Curved fingers give greater comfort and make gripping tools and other objects easier. Made in both knit and gauntlet wrist style, manufactured in one standard size. *The Pioneer Rubber Co.*

IT'S NEW — CHECK IT

(8) RESPIRATORY PROTECTOR has replaceable chemical canister which generates its own oxygen and gives the wearer 1 hour's protection in unbreatheable air. Weighs but 13½ lb., does not use cylinders or high-pressure fittings. For uses where high concentrations of poisonous gas or oxygen deficiencies are encountered. Exhaled breath passes from facepiece through exhalation tube and into the

canister where carbon dioxide is removed. Evolved oxygen flows into the breathing-bag reservoir, then to the facepiece through the inhalation tube. Before the canister is exhausted, a preset alarm bell rings a warning to replace the canister with a fresh one. *Mine Safety Appliances Co.*

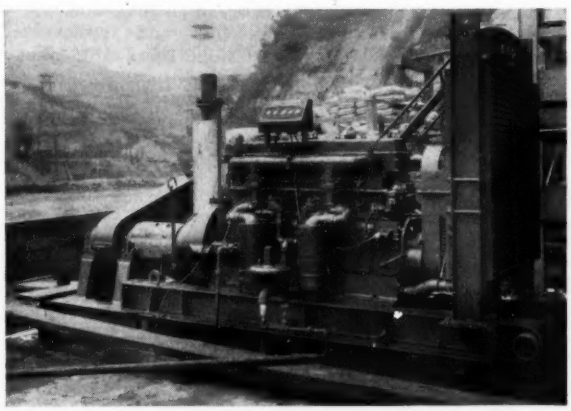
IT'S NEW CHECK IT



(9) A 25,000-LB. PRESSURE BOOSTER developed for testing tubing and casing threaded connections. Utilizes available water or air pressure. A source pressure of 225 psi. develops 25,000 lb. discharge pressure. Requires no motors or pumps. Also available for operating on lower pressure sources. *Martin-Decker Corp.*

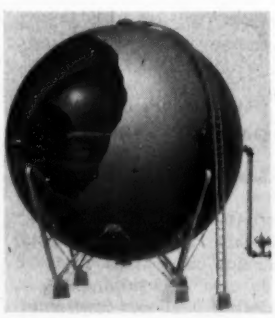
IT'S NEW CHECK IT

(10) NEW HEAVY-DUTY ENGINES have crankshaft supported by seven main bearings located in the lower crankcase, and accessible through large hand-hole plates.



The lower crankcase is water cooled, controlling the lubricating-oil temperature by warming it if the engine is operating on a light load, or by cooling it on heavy loads. Pictured is a Model 357-O driving a mud pump at Ventura, Calif. For drilling rigs, mud pumps, shipping pumps, etc. *Hall-Scott Motor Car Co.*

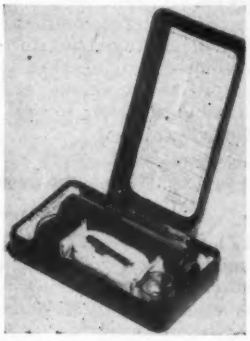
IT'S NEW CHECK IT



(11) VAPORSPHERE reduces evaporation losses from flat-bottom tanks storing volatile liquids. Provides temporary storage for vapor displaced by breathing. Is connected to the vapor spaces of flat-bottom tanks storing motor gasoline or other volatiles. When increasing temperatures cause expansion in the tanks the excess vapor flows through the vapor lines into the Vaporsphere where it is stored temporarily. When conditions causing its displacement have changed, the vapor returns to the tanks. Uses a flexible hemispherical membrane on the inside, connected to the shell at the equator. Vapor is stored beneath the membrane. *Chicago Bridge & Iron Co.*

IT'S NEW CHECK IT

(12) SNAKE-BITE KIT incorporates all developments from wartime experience in the treatment of poisonous snake bites. Suction for immediate treatment is provided by a small but powerful pump. A real lancet is supplied for making incisions and all other materials are of the finest approved type. Simple, illustrated directions are printed on the inside cover of the kit. Small enough to fit a purse or vest pocket. *B. F. McDonald Co.*



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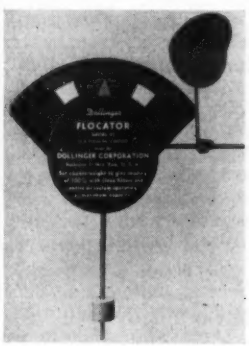

(13) AIR-FLOW INDICATING INSTRUMENT designed for use in any air-conducting system. Supplies the percentage of maximum flow being obtained. Warns against loss of air flow from any cause. Manufactured in two models, No. 45 for small-capacity, and No. 75 for large-capacity systems. *Dollinger Corp.*

IT'S NEW CHECK IT

(14) POWER FACTOR REGULATOR connected to commercial power line raises the power factor by taking off magnetizing current. Increases low voltage previously due to lower power factor, and cuts power bills. Gives more uniform operation of all motors and machines due to greater line stability. Reactors and transformers are of dry type construction. Can be installed in any location. *Modern Control Equipment Co.*

IT'S NEW CHECK IT

TRADE LITERATURE

(15) "INSTRUMENT SPRINGS" is a new 12-page semi-technical treatise on designed and manufactured instrument springs. Formulas, curves and illustrations are used to present the story behind instrument spring manufacture. *All-Weather Springs.*

IT'S NEW ✓ CHECK IT

(16) TANK EQUIPMENT, GAS CONTROL, SAFETY DEVICES. A handbook and catalog containing 188 pages, one of the most complete of its kind to come to our attention. Sectionalized through the use of tabs it contains sections on engineering, venting, gaging, swing line, regulators, relief valves, and miscellaneous. A particularly valuable addition to any library. *Vapor Recovery Systems Co.*

IT'S NEW ✓ CHECK IT

(17) CONDENSER INJECTOR New bulletin illustrates condenser injector which instantly stops tube leaks while the condenser continues to operate. It describes the construction, operation, and installation of this simple, inexpensive insurance against untimely condenser shutdowns. *Condenser Service & Engineering Co.*

IT'S NEW ✓ CHECK IT

(18) PETROLEUM REFINING. A 60-page catalog containing 30 petroleum-refining processes selected as typical examples of more than 300 complete processing units. Each process is diagramed in color and accompanied by a statement of outstanding features, representing illustrations, simplified flow diagrams, and description of process flow. Significance of each unit is discussed and the process explanations will be highly interesting to refinery executives as well as to engineers. Also has many useful engineering data and tables giving properties of hydrocarbons. Highly recommended. *Foster Wheeler Corp.*

IT'S NEW ✓ CHECK IT

(19) NEW JACK CATALOG. New 64-page catalog lists lever, screw, and hydraulic jacks from 3 to 100-ton capacity. Catalog is convenient pocket size. Contains specifications, dimensions, capacities, weights, etc. Included also are products not manufactured for the last 2 years, due to government restrictions, and again available. *Templeton, Kenly & Co.*

IT'S NEW ✓ CHECK IT

(20) FEED-WATER HEATERS. Standard open deaerating feed water heaters are covered in three-page, two-color, ring-punched bulletin. Well illustrated and with cutaway drawings which show construction and operating details of this power-plant equipment. *The Swartwout Co.*

IT'S NEW ✓ CHECK IT

(21) TANDEM-AXLE OIL-FIELD TRAILERS for hauling heavy-oil-field equipment, pipe, and general freight are described in new broadside. Nose-loading models which can be converted to six-wheel type are also shown. Complete specifications of four models are given. *Spencer Trailer Co.*

IT'S NEW ✓ CHECK IT

(22) PRECISION CASTINGS is a new 20-page catalog describing in detail the lost wax casting method, and illustrating types of castings which may be made by this method using alloys which are ordinarily difficult to machine. This manufacturer describes methods by which they have obtained castings with dimensional tolerances as low as 0.005 in. as cast. Also available is a pamphlet containing tables of physical, mechanical and chemical properties of these alloys. *Haynes Stellite Co.*

IT'S NEW ✓ CHECK IT

(23) POWER PUMPS. Six-page, ring-punched bulletin describes 2, 4, 5, and 6-in.-stroke pumps with hydraulic systems, boiler feed, water flooding, pipe lines, and similar uses. Cutaway sectional drawings, and application photographs and tables of sizes and operating data make this informative and easy to read. *Worthington Pump & Machinery Corp.*

IT'S NEW ✓ CHECK IT

(24) INSULATING CEMENT. New four-page, fully illustrated folder provides actual information, tables and charts on the efficiency, coverage and ease of application of this all-purpose thermal insulation. *Baldwin-Hill Co.*

IT'S NEW ✓ CHECK IT

(25) DIRECT FIRED HEATERS. Oil-fired, gas-fired, coal-fired, and combination models are illustrated and described, together with typical installation setups and actual operating data, in this new 16-page booklet. Styles, capacities, dimensions and sizes are adequately covered in charts and tables. *Dravo Corp.*

IT'S NEW ✓ CHECK IT

(26) FUEL-OIL HEATERS. Handy reference for heating engineers and others working on fuel-oil combustion problems. Included is a handy viscosity-temperature chart which shows at a glance the temperature required to reduce oil to desired viscosity. Also described, with complete specifications and capacities, is this manufacturer's line of fuel-oil heaters. *The Whitlock Manufacing Co.*

IT'S NEW ✓ CHECK IT

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Natural Gas

Louisiana Legislature Asks Increase in Gas Prices

BATON ROUGE. — With the move for a five-fold increase in the gas gathering tax defeated, the Louisiana Legislature has turned its attention to bringing about an increase in the field price of all natural gas produced in the Southwest.

In a resolution, the legislature urged the governor "to immediately take such steps as may be necessary in an effort to obtain the full and complete cooperation of the other southwestern gas-producing states with the view of bringing about a substantial increase in the wellhead price of natural gas in the state of Louisiana and the entire Southwest."

Another measure, which has been approved by the state senate committee on conservation, would authorize the State Corporation Commission to fix minimum field prices for natural gas produced and sold in Louisiana. Under the terms of the proposal, the commission would be employed to review the prices in the various Louisiana fields from time to time with a view to changing the minimum price in any field.

Though the gathering tax proposal is now considered virtually killed, another plan being offered the legislature calls for a sales tax of 3 cents per 1,000 cu. ft. on natural gas. The effect of this plan on the natural-gas industry is regarded as practically the same as that of the gathering tax, and its prospects of passage are not considered good.

Drop in Industrial Use Lowers Gas Consumption

NEW YORK.—Consumption of natural gas in the first quarter, 1946, amounted to 638,354,700,000 cu. ft., compared with 661,981,700,000 cu. ft. for the same period last year, according to figures compiled by the American Gas Association. While residential sales have shown a steady increase over previous years, the drop of 3.6 per cent in total consumption is accounted for principally in the industrial market. Industrial use of natural gas was 11 per cent less this year, while natural gas used for generating electricity was down 21.3 per cent.

Aggregate sales, including manufactured gas, of 811,429,000,000 cu. ft. through March 31, 1946, showed a slight decline of 2.2 per cent against last year's first-quarter sales of 830,094,000,000 cu. ft., despite the 2.6 per cent gain of new customers served by the gas industry and an increase of 2.2 per cent gain in revenue. Total natural gas customers as of March 31, 1946, were 9,153,100.

Total revenue from gas utility sales for the 3 months ended March 31, amounted to $373,380,600, an increase of 2.9 per cent over the figure of $362,637,300 in the like period of 1945. Sales of industrial gas amounted to $63,041,700, a decline of 11.9 per cent under the comparable period of 1945, while residential sales were $253,462,700, a gain of 7.3 per cent over last year.

FPC Authorizes Company To Continue War System

WASHINGTON.—Arkansas Louisiana Gas Co., Shreveport, has been authorized by the Federal Power Commission to continue operation of its "L" distribution system, construct additional facilities at a cost of $530,391, and to remove portions of the line no longer needed. The distribution system was built under contract with Defense Plant Corp. to serve gas to Arkansas war plants.

Additions to the system consist of 16 miles of 12-in. connecting pipe line extending from Bauxite Junction to Little Rock, Ark., 5 miles of 12-in. pipe and 4½ miles of 8-in. pipe to serve the Lynch power plant now under construction by Arkansas Power & Light Co. at Rose City, near North Little Rock; and to supply gas to Aluminum Ore Co. and two plants of the Dulin Bauxite Co. The new facilities would eliminate need for portions of lines serving the latter two companies, the gas company said, and the application asked authority to remove 20,082 ft. from these lines.

New Ohio Fuel Gas Rates Placed in Effect by FPC

WASHINGTON. — New rates on wholesale gas sold by Ohio Fuel Gas Co., representing an estimated reduction of $700,000 annually, have been declared effective by the Federal Power Commission as the culmination of proceedings started in 1942.

The rate reductions were decided on by agreement with company representatives following a field investigation by commission staff members, FPC said. About 20 per cent of the company's sales are subject to the commission's jurisdiction. FPC directed Ohio Fuel Gas to submit revised rates reflecting further reductions if lower costs of gas purchased by the company result from other proceedings pending before the commission.

Order to Be Reconsidered

WASHINGTON. — The Federal Power Commission has set August 22 for rehearing in Washington of its order under which Michigan Consolidated Gas Co. was classified as a natural-gas company within the meaning of the Natural Gas Act. The reopening of the docket is in response to a request by the company which asserts that the commission erred in its original findings.

Cabot Reports Record Carbon-Black Output

NEW YORK. — Godfrey L. Cabot, Inc., which through subsidiaries manufactures and sells carbon black, reported last week it produced more carbon black by the channel process in May than in any other month in its history.

Output of channel black by Cabot plants during the first 5 months of 1946 was 40 per cent higher than in the corresponding 1945 period. A 34 per cent increase was reported in manufacture of furnace-type blacks for the same period. The increases were over and above wartime levels.

Natural Gasoline

United Gas Pipe Line's New Plant in Operation

CARTHAGE, Tex. — United Gas Pipe Line Co. has begun operations at its new gasoline plant near here which is designed to recover up to 150,000 gal. daily of motor fuel, kerosene, liquefied petroleum gases, and other products.

The entire installation comprises the gasoline and dehydration plants, housing facilities for employes, and equipment of one of the key radio stations in the company's new network serving the Carthage-Sterlington pipe line. It is located south of Carthage on U. S. Highway 59.

The plant will process completely 100,000,000 cu. ft. of gas daily and up to 50,000,000 cu. ft. partially. The gathering system totals more than 100 miles and takes production of 81 wells in the Carthage field.

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DROP FORGED STEEL
LIQUID LEVEL GAGES

Used to observe color and density of liquids under high pressures and/or temperatures. Construction exceptionally sturdy. Made of alloy temperature resisting steel, and are highest quality throughout. Liquid chamber made from solid block of steel to assure perfect alignment and rigidity. Conform with A.P.I.—A.S.M.E. requirements.

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REFINING

Shell Chemical Building Two New Houston Plants

HOUSTON.—First commercial production of glycerin epichlorohydrin, a petroleum chemical used in the manufacturing of plastics, fumigants, industrial solvents, will begin shortly at Shell Chemical Corp.'s new Houston plants, according to B. M. Downey, Houston manager of Shell Chemicals.

Addition of the new units, at an approximate cost of $3,000,000, will also increase, by 100,000,000 lb. a year, Shell's production of isopropyl alcohol, used in antifreeze, solvents, in the rayon and surface-coating industries, and in the conversion to other chemicals, including acetone.

"These chemicals," company officials said, "are all derived from propylene gas, a product of petroleum cracking plants and are typical of the many useful commodities now being made from gas which was formerly burned."

Two plants, one for making glycerin epichlorohydrin commercially and the other for manufacturing isopropyl alcohol, are being built adjacent to Shell's Deer Park refinery. Downey said the plants being built comprise a project separate from the $6,000,000 Shell chemical plant approved by the Civilian Production Administration last month.

C. F. Braun & Co. is contractor for the isopropyl alcohol unit. Fluor Corp., Ltd., is building the glycerin epichlorohydrin part of the project for Shell.

Gulf Coast Runs Rise to 92 Per Cent of Capacity

HOUSTON.—Crude runs to stills of plants in the Gulf Coast Refiners Association showed a marked gain the first half of June to 92 per cent of the rated 158,000-bbl. daily operating capacity.

The association's semimonthly report listed runs to stills at 145,376 bbl. daily. Runs to stills during the last half of May were 70.4 per cent of capacity, and during the first half of June, 60.6 per cent of capacity.

Stocks of kerosene, gasoline, and naphthas gained during the first half of June. Stocks of all grades of gasoline and naphthas increased during the period by 315,621 bbl. and were reported at 2,204,774 bbl. A year ago gasoline stocks were 1,707,823 bbl.

Aviation gasoline stocks June 15 were 335,746 bbl., indicating an increase of 6,474 bbl. Automotive gasoline stocks considered alone were 1,544,516 bbl. June 15, showing an increase of 294,597 bl. Kerosene stocks at 437,203 bbl. June 15 indicated an increase of 136,849 bbl. Diesel gas-oil inventories June 15 were 70,132 bbl., reflecting a decrease of 130,732 bbl. Stocks of other grades of gas oil increased 93,152 bbl. to 895,355 bbl. Stocks of No. 5 fuel oil increased 216,957 bbl. to 244,042 bbl., and Bunker C fuel-oil stocks decreased 120,511 bbl. to 281,511 bbl. June 15.

Jersey Standard Cracking Capacity at 258,000 Bbl.

A total of nearly 400,000 bbl. per day of crude refining capacity is shown in recent reports for all Standard Oil Co. of New Jersey refineries.

This capacity is divided between five refineries, the highest at Baton Rouge in the Louisiana division, and

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"GUNITE" CONCRETE SINCE 1915

CAPACITIES OF STANDARD OIL CO. OF NEW JERSEY REFINERIES* AS OF JANUARY 1, 1946
(Figures in barrels per day)

Location—	Crude capacity	Cracking capacity— Catalytic	Thermal	Alkylation capacity charge	Isomerization	Polymerization
Baton Rouge, La.	155,000	55,000	44,500	7,650	6,000	1,250
Bayonne, Linden, N. J.	155,000	20,000	71,000	.....	.....	8,200
Baltimore, Md.	47,400	22,000	13,500	10,600	.....	.....
Charleston, S. C.	7,200	.....	.....	.....	.....	.....
Everett, Mass.	34,000	.....	32,000	.....	2,800	.....
Totals	398,600	97,000	161,000	18,250	8,800	9,450

*Does not include refineries of Humble Oil & Refining Co. or subsidiaries operating outside the United States.

at Bayonne, N. J., each reporting 155,000 bbl. daily, and the smallest at Charleston, S. C., with 7,200 bbl. daily and no cracking capacity.

More than 250,000 bbl. of cracking capacity is reported, of which 161,000 bbl. daily is thermal tube-and-tank, and 97,000 bbl. daily is fluid catalytic capacity. Alkylation via the sulfuric-acid catalyst process is well represented, showing 18,250 bbl. daily in two plants, Baton Rouge and Baltimore, Md. Isomerization claims 8,800 bbl. daily, most of which was shut down as of January 1. Polymerization was operating at the reported capacity of 9,450 bbl. daily, of the U.O.P. phosphoric-acid catalyst process.

WAA Leases Catalyst Plant; Offers Other Properties

WASHINGTON. — The lease of a catalyst plant to Houdry Process Corp., sale of miscellaneous property to Utah Oil Refining Co., and the offering of a Texas butadiene and an Ohio catalyst plant were announced last week by War Assets Administration.

The synthetic cracking catalyst plant leased by Houdry Process Corp. for 1 year, is located at Paulsboro, N. Y. Houdry operated the plant during the war. WAA said Houdry plans to engage in the manufacture of the catalyst for a trial period of 1 year to determine if production is economically feasible. Minimum rental for this experimental period has been set at $35,000.

Utah Oil Refining, Salt Lake City, purchased for $10,980 the remaining portion of the 100-octane gasoline plant at Salt Lake City which the company recently bought from WAA for $4,148,300. Included in the latest purchase were two storage tanks, a railroad siding, 4½ acres of land, and an unloading rack at Fort Laramie, Wyo.

The butadiene plant offered for sale or lease is located at Port Neches and was operated during the war by Neches Butane Products Co. The plant itself is part of the rubber reserves program but the portion offered has been released for disposal, WAA said. Total government investment in buildings, machinery and equipment is about $1,000,000.

The complete, silica-alumina catalyst-manufacturing plant offered has a rated capacity of 10,800 tons per year. Located in Cincinnati, Ohio, the plant was leased and operated during the war by Diakel Corp. for the production of catalyst for use in fluid catalytic cracking units, the production being used largely in the manufacture of 100-octane aviation gasoline, WAA said.

Patents Made Available

WASHINGTON. — Fire extinguishers that smother flames with foam are covered by patents made available for license by James E. Markham, alien property custodian. Twelve patents of this type seized from enemy nationals are available on a royalty-free, non-exclusive basis to American citizens. An administrative fee of $15 is charged for each patent licensed.

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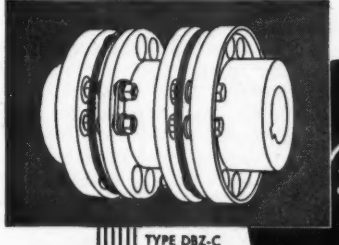
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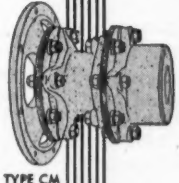
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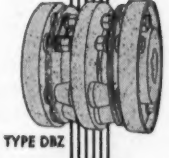
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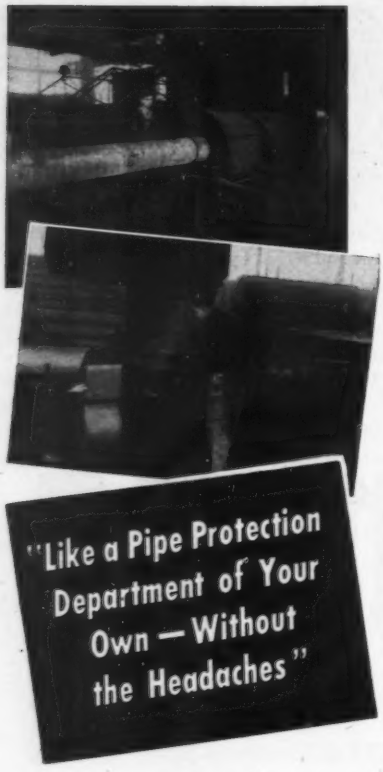

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PIPE LINES

Empire's New Project In Partial Operation

BARTLESVILLE, Okla. — Though construction has been delayed because of difficulty in obtaining materials, Empire Pipeline Co.'s new expansion project on the Sour Lake, Tex.-Lake Charles, La., crude line is now in partial operation and will be completed by the end of the year.

The work includes a new station on a 90-acre site about ½ mile east of the Sour Lake station of Texas Pipe Line Co. along the main line feeding the Lake Charles refinery of Cities Service Refining Corp. with which Empire Pipeline is affiliated. An intermediate pumping station is being installed near Orange, Tex.

The 65-mile, 12-in. Lake Charles line was constructed in 1943 under a plan whereby Texas Pipe Line would do all pumping. Six storage tanks were constructed by Empire Pipeline on the Texas Pipe Line tank farm, and two more were built in which Empire holds an interest.

Later, larger refinery requirements resulting in increased deliveries and the handling of a large number of streams and grades of crude, coupled with increased demand on Texas Pipe Line's pumping units, made additional tankage and capacity necessary, Empire officials said. The location for the new Sour Lake station was chosen because of the lack of additional station capacity at the Texas Pipe Line's Sour Lake station.

Empire's new Sour Lake station consists of three units, one of which will be an electric unit similar to those at Orange station and two diesel-engine-driven centrifugal pumps. Upon completion of the station, Empire's capacity from Sour Lake to Lake Charles will be increased from about 50,000 bbl. daily to approximately 87,000 bbl. daily. Four 80,000-bbl. tanks are now under construction at the new Sour Lake station and farm. Four more of 80,000-bbl. capacity and four of 55,000-bbl. capacity are on order. The company is relinquishing its pumping capacity and tankage at Texas Pipe Line's station.

The Orange, Tex., station consists of two 800-hp. electric centrifugal pumps. While the station increased capacity of the Sour Lake-Lake Charles line to around 75,000 bbl. daily, it failed to relieve the load on the Texas Pipe Line's pumps or the congested tankage.

Construction of the new station is being handled by Cities Service Oil Co.'s engineering and construction department with R. V. Johnson in charge.

Oklahoma Plant Surveying For Gathering System

OKLAHOMA CITY. — Johnson Oil Refining Co. which operates a 5,500-bbl. daily crude capacity refinery at Cleveland, Okla., has made a survey for a gathering system to connect with producing properties of T. E. Berry and associates in Payne County.

The Johnson plant has been getting most of its crude in Pawnee and Osage counties. Midland Wholesale Cooperative's refinery at Cushing, a 4,000-bbl. capacity plant, has been running the crude from the Berry properties which amounts to about 700 bbl. daily.

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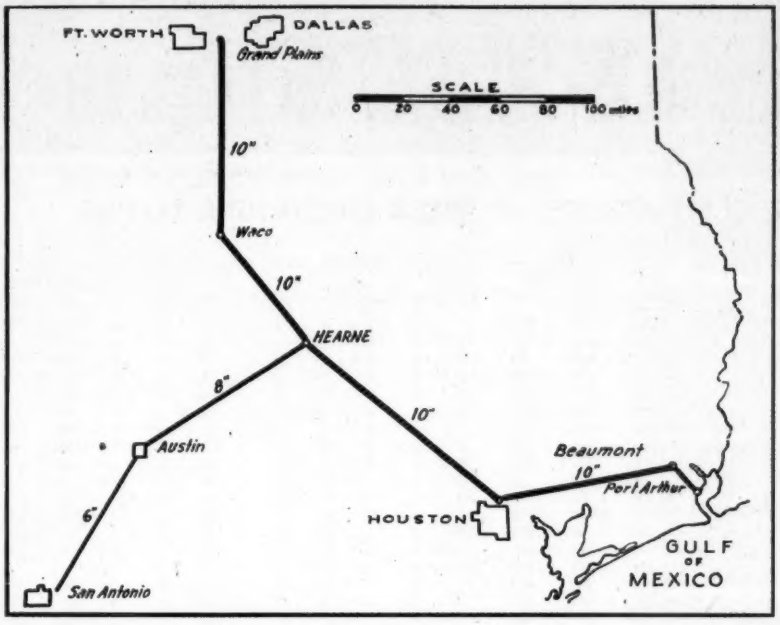

Traced on this map is the general route of the new products pipe line planned by Texas Pipe Line Co. and Magnolia Pipe Line Co. Magnolia will build the Beaumont-Hearne section, and Texas Pipe Line, the carriers extending from Hearne to San Antonio and to the Dallas-Fort Worth area. Because of delays in obtaining pipe, construction will not begin until early next year. Preliminary right-of-way surveys are to get under way within the next few weeks. Only stations currently contemplated are those at the Beaumont point of origin and the Hearne central terminal. Intermediate stations will be added when demands for capacity are determined. The Beaumont-Port Arthur section is a feeder line; others are planned to various refineries in the area

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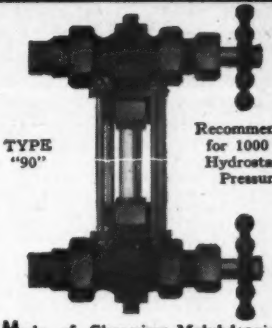

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Made of Chromium-Molybdenum alloy temperature resisting steel, extra heavy throughout and stainless steel trimmed. Positive automatic shut-off; stainless steel balls shut off the flow of liquid if glass breaks. Regrinding removable seats, heavy duty stuffing boxes, union connections. Conform with A.P.I.—A.S.M.E. requirements.

This is one of the complete line of Penberthy gages that meet every liquid level gage requirement.

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BUCKEYE MODEL 11 for Speed and Economy on gathering, product and natural gas lines. Digs trench 11½" to 22" wide — up to 5' deep.

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PIPE LINES

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Oklahoma Lines Planned By Cities Service Gas

OKLAHOMA CITY.—Cities Service Gas Co. is planning construction of 64½ miles of 12-in. gas line from the West Edmond field in Oklahoma to the Drumright (Okla.) compressor station, S. B. Irelan, president of the company, announced here last week.

Cities Service Gas also is preparing to build a 6½-mile 16-in. line from the company's Craig storage field. The Federal Power Commission has authorized the company to begin work on both projects in August. Cost is estimated at $1,075,000.

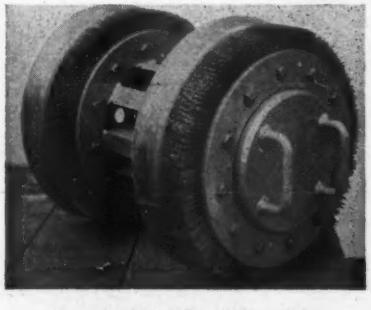
Completion of the new West Edmond line will increase capacity of facilities for taking gas from the field to a total of 60,500,000 cu. ft. daily, about 27,500,000 cu. ft. daily more than the company is now buying there. The two new lines will give Cities Service Gas approximately 50,000,000 cu. ft. daily of additional gas to meet peak load demands.

Interstate Laying Line

Interstate Oil Pipe Line Co. is building a 6-mile, 4-in. crude line from the Lone Grove area in Oklahoma to connect to the northwest end of the old Brock field in Carter County. Interstate has connections with two new producers in the area.

WRITE FOR LATEST INFORMATION.

Improved LCN Pig
Assures Maximum Gas Thru-put



Type LCN Pipe Line Pig

- For internal cleaning of natural gas transmission lines.
- Sizes 16 to 26-inch, inclusive.
- Rugged, light-weight steel construction.
- High velocity gas, jetting through enlarged by-pass, sweeps debris ahead of Pig.
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Types RC and SCN Pigs available for cleaning gas lines smaller than 16-inch.

THE PIG WITH THE POKE CLEANS PIPE LINES
T. D. WILLIAMSON, Inc.
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STATISTICS and

WEEKLY WELL COMPLETIONS . . . WEEK ENDED JUNE 29, 1946

	Total of all wells					Cum. to date		Wildcat completions and discoveries					Cumulative total, 1946				
	Comp.	Oil	Gas	Dry	Footage	1946	1945	Oil	Dist.	Gas	Dry	Total	Oil	Dist.	Gas	Dry	Total
New York	30	15	0	‡15	43,251	776	619	0	0	0	0	0	0	0	0	0	0
Pennsylvania	76	41	2	§33	112,306	1,986	1,795	0	0	0	0	0	0	0	0	0	0
West Virginia	14	1	12	1	40,518	347	379	0	0	0	0	0	0	0	0	0	0
Ohio	37	12	14	11	96,941	579	409	0	0	0	1	1	2	0	10	18	30
Indiana	12	7	0	5	21,440	164	85	0	0	0	0	0	2	0	0	9	11
Kentucky	20	8	3	9	29,505	234	203	0	0	0	4	4	2	0	0	20	22
Illinois	41	25	0	16	109,003	1,033	771	1	0	0	6	7	21	0	0	176	197
Michigan	20	4	1	15	44,659	386	362	2	0	0	7	9	12	0	5 •	123	140
Kansas	29	16	0	13	97,332	960	758	1	0	0	4	5	15	0	0	119	134
Neb., Mo., Iowa	0	0	0	0	0	9	12	0	0	0	0	0	0	0	0	5	5
Oklahoma	59	36	2	*21	139,780	1,169	1,145	2	0	0	7	9	37	0	19	143	199
Texas	174	102	9	63	671,986	3,957	3,395	1	0	2	37	40	93	18	14	635	760
North Central	72	31	2	†39	168,668	1,420	993	0	0	1	21	22	25	0	1	259	285
West	41	35	0	6	210,879	823	901	0	0	0	2	2	24	0	1	84	109
Panhandle	5	3	2	0	15,316	173	253	0	0	0	0	0	0	0	0	5	5
Eastern	15	12	0	3	69,369	368	153	0	0	0	2	2	10	0	1	46	57
Gulf Coast	26	19	3	4	162,809	884	783	1	0	0	3	4	24	16	6	134	180
Southwest	15	2	2	11	44,945	289	312	0	0	1	9	10	10	2	5	107	124
Louisiana	21	16	1	4	120,863	649	473	0	0	1	3	4	29	5	4	82	120
Northern	12	10	1	1	44,386	352	165	0	0	0	1	1	6	0	0	46	52
Southern	9	6	0	3	76,477	297	308	0	0	1	2	3	23	5	4	36	68
Arkansas	6	4	0	2	11,901	90	81	0	0	0	1	1	3	0	0	17	20
Mississippi	16	8	0	8	101,259	133	168	0	0	0	5	5	1	0	1	37	39
Southeastern States	1	0	0	1	8,472	22	24	0	0	0	1	1	0	0	0	19	19
Montana	2	1	1	0	4,204	142	150	0	0	0	0	0	9	0	0	15	24
Wyoming	3	1	0	2	11,387	82	87	0	0	0	1	1	8	0	3	22	33
Colorado-Utah	5	5	0	0	31,619	66	15	0	0	0	0	0	3	0	0	8	11
New Mexico	9	4	3	2	33,774	183	218	0	0	0	1	1	3	0	0	20	23
California	33	29	2	2	135,619	896	1,103	0	0	0	2	2	4	0	2	110	116
Total United States	608	335	50	223	1,865,819	13,863	12,252	7	0	3	80	90	244	23	58	1,578	1,903
Total previous week	577	303	48	226	1,815,383	13,255	13,255	11	1	0	73	85	237	23	55	1,498	1,813
Total June 30, 1945	534	282	57	195	1,735,343			6	0	2	77	85	259	9	62	1,587	1,917

Service wells included: *1, †3, ‡15, §33.

MARKET QUOTATIONS

(Quotations shown here are f.o.b. plant in tank cars and in cents per gal. as of last Monday.)

REFINERY GASOLINE

Octane (A.S.T.M.)	78-78½†	73-75
Mid-Continent*	6.750	6.000
Texas Gulf Coast	6.375	5.750
New York Harbor	7.375	6.375
California		6.00-6.875

*Basic Oklahoma Group 3. †1939 C.F.R. (research method).

NATURAL GASOLINE

Grades:	26-70	18-55
Oklahoma (Group 3)	3.250	3.900
N. Texas (f.o.b. plant)	2.750	3.300
N. Louisiana (f.o.b. plant)	3.125	3.750
California	4.875	5.500

CRUDE-OIL PRICES

Representative posted schedules per bbl.	
East Texas	$1.35
Conroe	1.53
Tepetate, Louisiana, avg. grav.	1.30
Illinois Basin	1.47
Pecos County, Texas	1.05
Bradford, Pennsylvania	3.10
Van, Van Zandt County, Texas	1.18

Note: Exclusive of subsidy.

GRAVITY SCHEDULES

Top prices include all gravities above grades designated, and low prices include all gravities below grades designated:

Gravity—	Signal Hill, Calif.	Okla-homa, Kansas	Gulf Coast Texas	West Tex.*
18-18.9	$0.90			
19-19.9	.94		$1.16	$0.80
20-20.9	.98	$0.95	1.18	.82
21-21.9	1.02	.97	1.20	.84
22-22.9	1.06	.99	1.22	.86
23-23.9	1.10	1.01	1.24	.88
24-24.9	1.13	1.03	1.26	.90
25-25.9	1.17	1.05	1.28	.92
26-26.9	1.21	1.07	1.30	.94
27-27.9	1.25	1.09	1.32	.96
28-28.9	1.28	1.11	1.34	.98
29-29.9	1.30	1.13	1.36	1.00
30-30.9	1.33	1.15	1.38	1.02
31-31.9		1.17	1.40	1.04
32-32.9		1.19	1.42	1.06
33-33.9		1.21	1.44	1.08
34-34.9		1.23	1.46	1.10
35-35.9		1.25	1.48	1.12
36-36.9		1.27	1.50	1.14
37-37.9		1.29	1.52	1.16
38-38.9		1.31	1.54	1.18
39-39.9		1.33	1.56	1.20
40 and above		1.35	1.58	1.22

*Includes Lea County, New Mexico.

A.P.I. REFINERY REPORT

Week ended June 22, 1946

(Figures in thousands of barrels)

	Dly. crude runs to stills	Stocks: Gaso-line	Dis-tillate	Resid-ual
East Coast	816	22,890	11,272	8,517
Appalachian	158	3,547	567	388
Ill., Ind., Ky.	749	18,608	5,029	3,663
Okla., Kan., Mo.	381	8,233	2,218	1,270
Inland Tex.	212	2,942	361	673
Tex. Gulf Cst.	1,188	14,214	6,190	5,678
La. Gulf Cst.	335	3,712	1,641	1,335
N. La., Ark.	52	1,832	454	174
Rocky Mt.	141	2,151	494	747
California	804	14,765	8,194	24,081
Total 6-22-46	4,836	92,894	36,420	46,526
Total 6-15-46	4,799	93,449	35,582	45,915
Total 6-23-45	5,067	87,099	31,694	40,165

CRUDE-OIL STOCKS

(Bureau of Mines Estimate)

Week ended—	Bbl. of crude*
June 22, 1946	222,193,000
June 15, 1946	220,106,000
June 23, 1945	220,974,000

*Excludes unrefinable Calif. stocks.

TRENDS

DAILY AVERAGE PRODUCTION FOR WEEK

	June 29 crude oil	B. of M. June demand	June 22 crude oil
Alabama	1,100	750	1,150
Arkansas	77,900	79,000	78,650
California	886,750	848,000	880,150
Colorado	29,960	26,000	29,700
Eastern	67,000	64,200	67,500
Florida	200	250	250
Illinois	206,350	210,000	207,600
Indiana	19,700	18,000	19,900
Kansas	260,300	255,000	277,450
Kentucky	30,700	31,000	31,200
Louisiana	384,200	380,000	386,450
North Louisiana	88,100	.....	90,350
South Louisiana	296,100	.....	296,100
Michigan	48,150	46,000	45,150
Mississippi	63,500	57,000	63,150
Montana	25,690	22,000	26,800
Nebraska	750	800	750
New Mexico	97,600	98,000	97,600
Oklahoma	387,100	380,000	388,500
Texas	2,243,750	2,050,000	2,243,750
District 1	19,650	.....	19,650
District 2	155,650	.....	155,650
District 3	515,400	.....	515,400
District 4	229,600	.....	229,600
District 5	43,950	.....	43,950
East Texas	326,000	.....	326,000
District 6	107,350	.....	107,350
District 7B	32,400	.....	32,400
District 7C	28,450	.....	28,450
District 8	566,450	.....	566,450
District 9	132,400	.....	132,400
District 10	86,450	.....	86,450
Wyoming	110,090	104,000	109,150
Total United States	*4,940,790	4,670,000	4,954,850
Change from previous wk.	down 14,060		

Total production January 1-June 29 ..... †841,566,219 bbl.
Same period last year (crude, plus condensate).. 863,265,200 bbl.

*Not incl. 26,200 bbl. condensate. †Incl. 4,608,400 bbl. condensate.

CRUDE-OIL STOCKS 222,193,000 bbl. as of June 22—up 2,087,000 bbl. One year ago 220,974,000 bbl.

GASOLINE STOCKS 92,894,000 bbl. as of June 22—down 555,000 bbl. One year ago 87,099,000 bbl.

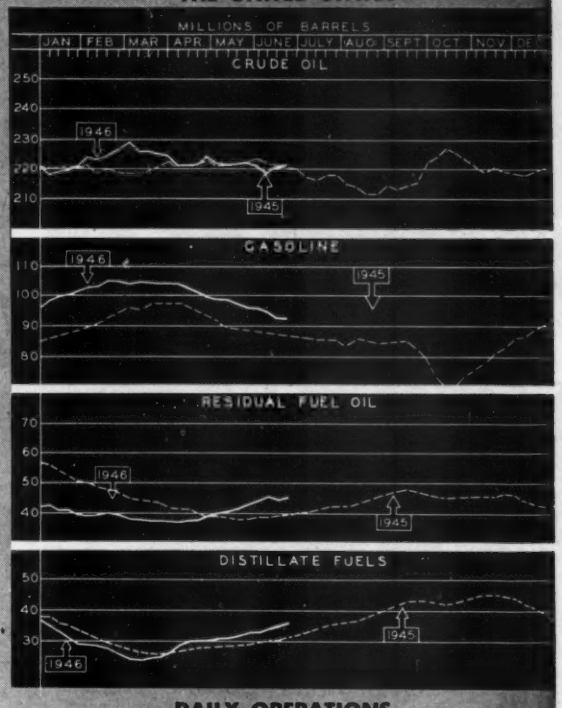
RESIDUAL FUEL-OIL STOCKS 46,526,000 bbl. as of June 22—up 611,000 bbl. One year ago 40,165,000 bbl.

GAS OIL AND DISTILLATE STOCKS 36,420,000 bbl. as of June 22—up 838,000 bbl. One year ago 31,694,000 bbl.

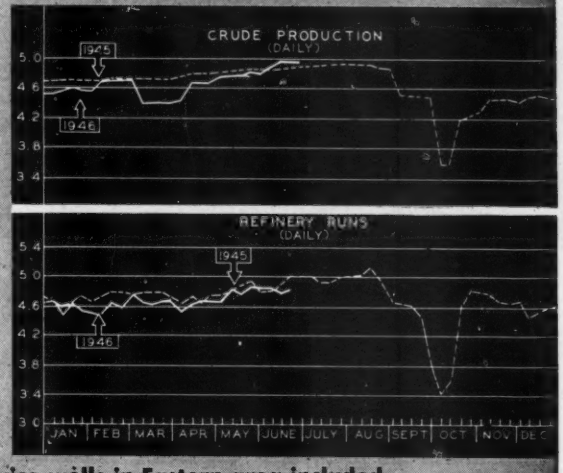
CRUDE-OIL PRODUCTION 4,940,790 bbl. as of June 29—down 14,060,000 bbl. One year ago 4,894,650 bbl.

REFINERY RUNS 4,836,000 bbl. daily week ended June 22—up 37,000 bbl. One year ago 5,067,000 bbl.

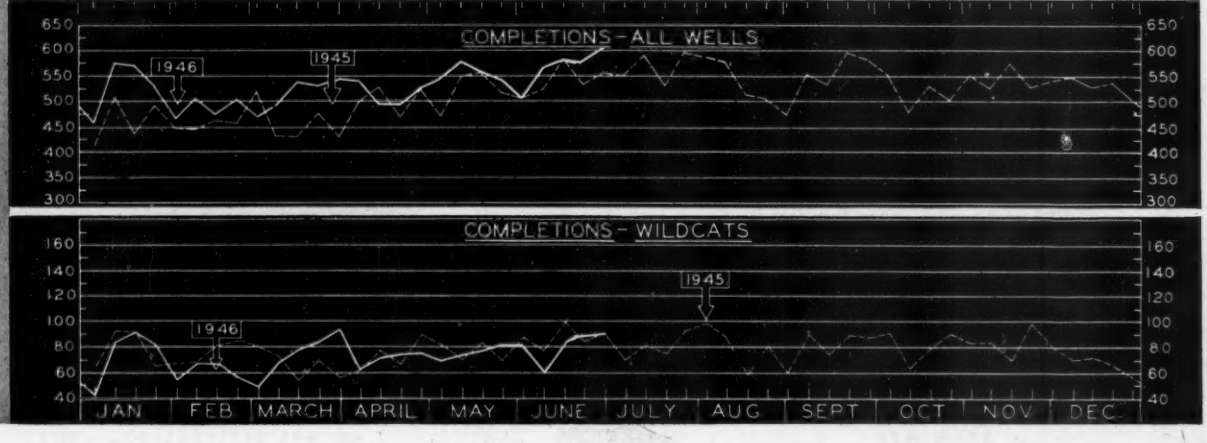
OIL STOCKS IN THE UNITED STATES



DAILY OPERATIONS



Solid line charts weekly completions, service wells in Eastern area included



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Exploration and Drilling

Clay, Water, and Oil

IT is commonplace to state that this branch or that branch of our industry is getting more technical all the time. But it is unusual when one phase of technology, developed independently for different purposes by two separate branches of the industry, opens up fields of knowledge that give signs of converging. When this same subject shows possibilities of application in still other phases of the industry's operations, it becomes very unusual. The interrelationship of clays and waters is such a subject.

When the water-input wells of secondary-recovery projects began to plug up, the first steps naturally were studies of the input waters, and their treatment to remove the more obvious chemical precipitants that would result in sand plugging. But this did not solve the problem fully. Then research was started on the clay that is always present in the sandstone pays.

It was found that the type of water injected had a very definite effect on the clay in the sandstone; resulting in decreases or increases in effective permeability of very substantial magnitude. Now considerable basic research into clays and their properties is being carried on.

Meantime the problems of clay have been studied closely by the rotary-drilling branch of the industry for a long time. So much progress has been made that "mud engineering" is now a recognized special branch.

Now it is obvious that the secondary-recovery research into the properties of clays has already worked back to some of the same principles that the mud engineers had developed. From hindsight, this is seen to be natural. A mud engineer, seeking a low-water-loss mud, was actually seeking a low-permeability cake of clay on the walls of the hole. Although the secondary-recovery men want the exact opposite of a low-water-loss mud, an understanding of the principles involved is necessary, in order to manipulate conditions to achieve the opposite result.

It is interesting to note that the approach of the drilling and secondary-recovery branches started respectively with the opposite of the two materials common to both, water and clay. The mud engineers started with the clay, and experimented with various types of special muds and additives. From this beginning they long since went to the stage of considering the "makeup" water, and soon discovered this, too, was of considerable importance. The secondary-recovery men started with water and wound up studying clays.

Now the geologists and reservoir engineers are taking an interest in these studies, since they may indicate explanations for some puzzling problems that have been faced. At least a few geologists are wondering if the permeability effect of various types of water on the clay content of sandstones may not become a must in studying sedimentation problems.

MICHIGAN

Two Michigan Wildcats Completed as Oilers

SAGINAW.—Michigan oil and gas operators wrote off 15 or 20 completions as failures in the past week while setting up 17 locations for new drilling operations in 10 counties. Two of the four oil producers were classed as wildcat wells, one in Montcalm County, the other in Van Buren. The Montcalm well, in Day Township, was the McClure Drilling Co. 1 Wicks, pumping 50 bbl. a day after acid. The other was the W. D. Gannet 1 Chamberlain in Columbia Township, rated at 60 bbl. a day. A Gaines Township, Kent County, wildcat test got an oil show, but not enough to rate commercial. Other production was a 400-bbl. well in the Adams-Arenac field, a 3-bbl. completion in Foster, Ogemaw.

Drilling operations for the year increased to 353 as the new locations were announced, 3 in Allegan County, 2 each in Arenac, Newaygo, Mecosta, Bay and Van Buren, 1 each in Isabella, Mason, Mexford and Livingston.

MICHIGAN SUCCESSFUL WILDCATS

Montcalm County, Day Township: McClure Drilling Co. 1 E. Wicks, SW NE NW 36-11n-6w, pumping 50 bbl., acidized in Dundee, TD 3,345 ft., PB 3,338 ft.

Van Buren County, Columbia Township: W. D. Gannett 1 John Chamberlain, NE NW SW 17-1s-15w, pumping 60 bbl., acidized in Traverse lime, TD 1,130 ft.

MICHIGAN WILDCAT FAILURES

Allegan County, Casco Township: C. W. Kendall 1 Leach, SE NE NW 35-1n-16w, dry in Traverse, TD 1,151 ft.

Bay County, Beaver Township: Chapman Oil Co. 1 Mary E. Sovay, SE SE NE 24-15n-3e, dry in Antrim, TD 2,121 ft.

Isabella County, Lincoln Township: M. Bliss Keeler 1 Albert Anderson, SW NW NW 2-13n-4w, dry in Dundee, TD 3,738 ft.

Kent County, Gaines Township: Oil Producers, Inc. 1 Henrietta J. Brewer, NE SE SE 8-5n-11w, show of oil in Traverse, dry, TD 1,910 ft.

Montcalm County, Day Township: McClanahan Oil Co. 1 Lewis J. Roth, SE NE SW 24-11n-6w, dry in Dundee, TD 3,391 ft.

Osceola County, Leroy Township: Rowmor Corp. 1 J. A. and B. Peterson, SW SW NW 33-19n-10w, dry, TD 1,665 ft.

Van Buren County, Geneva Township; Neil Wagenaar 1 Rose Lundy Piper, NE SE NE 8-1s-16w, dry in Traverse, TD 1,065 ft.

CANADIAN FIELDS

Eastern Alberta Wildcat Flowing 65 Bbl. Daily

CHATHAM.—In the Provost area, eastern Alberta, Imperial-Provost 1, LSD 3, 27-37-3w4, finished at 2,549 ft., and set 9⅝-in. production string at 2,530 ft. for testing. The well has been flowing by heads, giving an average of 60 to 65 bbl. of around 28° gravity. The strike, in a new area south and a little west of Lloydminster, indicates a possibility of an important new field in the plains area.

West Flank.—In south Turner Valley, the old West Flank 2 well, which some months ago was given an experimental shot of over 5,000 qt., has been drilled out to below the shoe of the 6⅝-in. casing at 6,570 ft. The well was blocked following the shot last February. A little additional drilling is expected to clear the bridge. The original production level was 6,958 ft.

Duvernay.—On the Duvernay structure near Edmonton, Imperial-Duvernay 1, LSD 6, 30-55-11w4, has been abandoned at 2,978 ft. after striking water in the Devonian limestone. Imperial 2 has spudded in LSD 11, 29-55-12w4, 5 miles west and a little south of No. 1.

Fribourg.—A new wildcat test in northern Alberta has been located by Shell Exploration Co. in the Fribourg area, in LSD 14, 32-54-9w4. Location, testing holdings of around 500,000 acres, is about 15 miles southeast of the Imperial-Duvernay development.

Jumping Pound.—The important Shell 16-14-J, LSD 16, 14-25-5w5, on the Jumping Pound structure west of Calgary, is logging encouragingly, with Dalhousie sand at 10,000 ft. and Kootenay formation at 10,010 ft. The test got the Brown sand at the base of the Kootenay at 10,135 ft. and is deepening to the Madison.

Kinsella.—In the Kinsella field, east-central Alberta, Imperial-Kinsella 14, LSD 7, 28-45-9w4, finished at 2,048 ft., has been abandoned. The well got water and gas in the upper horizon of the Viking sand, and, on deepening, 30°-gravity crude rose 400 ft. Attempts to isolate the oil by cementing casing and perforating were unsuccessful. The oil apparently came from the base of the Viking sand but was much lighter than small shows of crude encountered in that horizon in other wells. Imperial-Kin-

sella 18, LSD 11, 27-45-10w4, about 5 miles farther west, has spudded.

Frog Lake.—The most northerly active test in Alberta, Elk Point 1, LSD 7, 26-56-5w4, has spudded in the Frog Lake area. The test, north and east of the Imperial-Duvernay drilling, is jointly sponsored by Anglo-Canadian, Home Oil and Calgary & Edmonton Corp., and is the first of a series of wildcat tests planned for various holdings in the north-central plans area.

PERMIAN BASIN

TXL Field Extended Two Miles Northward

MIDLAND.—The Texas Co. 1-F Fraser, Section 39, Block 45, T-1-N, T&P Survey, 2-mile extension to the TXL field, Ector County, has been completed to flow 362 bbl. of 42.5°-gravity oil in 6 hours through ½-in. choke on 2-in. tubing. Production is through perforations from 9,750-86 ft. in the Ellenburger. Gas-oil ratio was 942 to 1.

Brasted, Hyer & Dedberg will drill a wildcat 4 miles south of the east side of the Harper pool, Ector County. It is 1 Henderson, 660 ft. from the south and west lines of Section 6, Block 43, T-3-S, T&P Survey. The test is also 5 miles east of the north end of the Penwell field and the same distance west of the southern part of the South Cowden field.

Stanolind 1-P University, partly closing a gap between the Fullerton field in Andrews County and the most southerly producer from the regular Fullerton (Clear Fork) pay, flowed 181.98 bbl. of 42°-gravity oil daily for completion. Gas-oil ratio was 764 to 1. Pay between 6,930 ft. and plugged back depth of 7,108 ft. was treated with 2,000 gal. of acid. The well was originally a Devonian discovery, then nearly 3 miles southeast of the Fullerton 8,500-ft. (Devonian) field, completed for 430 bbl. of oil daily from 8,853-8,799 ft. Its yield declined and it was plugged back.

Humble Oil & Refining Co. 1 Pio Crespi, Section 19, Block 38, T-2-S, T&P Survey, 1 mile northwest of the Midland pool in Midland County, acidized with 2,000 gal. in perforations at 10,296-400 ft. and was swabbing with fluid level 4,000 ft. from the surface, showing a small amount of gas and a trace of oil.

Argo Oil Corp. 1 Dora Roberts, Section 294, Block 13, H&GN Survey, southeastern Reeves County wildcat 13 miles northeast of Balmorhea, was drilling below 11,717 ft. in sand. Humble 1 Harris, Section 114, Block 6, H&TC Survey, Sterling County wildcat 12 miles southwest of Water Valley, with total depth of 8,239 ft., was preparing to make a drill-stem test. There have only been slight oil and gas shows in the Ellenburger.

Taylor-Link field, Pecos County, had four completions this week. Keystone - Ellenburger field, Winkler County, Todd Deep field, Crockett County, Sand Hills-Tubb field, Crane County, and Pecos Valley High Gravity field each had three. McCamey field, Upton County, Howard - Glasscock field, Howard County, and Sharon Ridge field, Scurry County, each had three locations. TXL field, Ector County, has 28 drilling wells; Fullerton field, Andrews County, has 29; Keystone-Ellenburger field 26; Welch field, Dawson County, 12; Block 31 field, Crane County, 11; Keystone-Holt field, Winkler County, 8, and Martin field, Andrews County, 7.

WEST TEXAS WILDCAT FAILURES

Andrews County: Humble 1 Gaines et al, Sec. 14, Blk. A-39, PSL Sur., 9 mi. SE Eunice, New Mexico, elev. 3,460 ft., Devonian 8,598 ft., dry, TD 8,555 ft.

Dawson County: H. W. Snowden Oil & Gas 1 O. H. Kee, Sec. 75, Blk. M, ELRR Sur., 3 mi. SW Welch pool, elev. 3,104 ft., San Andrews 4,720 ft., dry, TD 5,100 ft.

SOUTHEASTERN NEW MEXICO

HOBBS.—Humble Oil & Refining Co. 1-B Federal-Leonard, 12-26s-37e, Ellenburger test ¼ mile north of the discovery of the Dublin pool of eastern Lea County, ran a 2-hour drill-stem test from 12,458-90 ft. Recovery was 120 ft. of drilling mud and 4,000 ft. of water. Flowing pressure was 1,750 lb. After a 15-minute shut-in period, it built up to 5,300 lb. Mud pressure was 6,500 lb. It was drilling below 12,498 ft. in lime.

Grayburg Oil Co. 10-A Kelley, 24-17s-29e, scheduled lower Permian wildcat in the shallow Grayburg-Jackson field in north central Eddy County 18 miles east of Artesia, was drilling below 5,000 ft. in the middle Permian. It has been credited unofficially with having logged several good shows since setting 7-in. casing at about 4,700 ft. Drilling to around 6,500 ft. is planned.

Fren and Grayburg-Jackson fields, Eddy County, the Langlie-Mattix and Paddock fields, Lea County, each had one completion. Square Lakes field, Eddy County, and Paddock field each had two locations and Langlie-Mattix, West Roberts and Drinkard fields, Lea County, each had one. Caprock field, Chaves and Lea counties, has 27 drilling wells; Drinkard field 17; Square Lake field 13; Grayburg-Jackson field 11, and Paddock field 8.

SOUTHEASTERN NEW MEXICO WILDCAT FAILURE

Eddy County: D. C. DeVito et al 1 State, 19-23s-36e, 9 mi. SW Carlsbad, elev. 3,408 ft., Delaware 1,680 ft., dry, TD 2,757 ft.

EASTERN TEXAS

Gregg County Test Finds Gas and Oil Shows

DALLAS.—B. F. Phillips 1 C. C. Crews, Leonard Perkins Survey, Gregg County wildcat 2½ miles west of production in the East Texas field, perforated with 22 shots from 3,714-20 ft., swabbed a little gas and oil with considerable salt water. Operator was preparing to squeeze the perforations and test further.

T. G. Shaw 1 Margaret Tilley, Charles L. Widgeon Survey, Abstract 938, Woodbine sand test in the Lone Star field, Cherokee County, is dry at 4,478 ft. It logged 2 ft. of sand with gas odor, but no stain, at 4,188-90 ft. in the Woodbine, topped at 4,118 ft. Elevation is 302 ft.

Humble Oil & Refining Co. R. G. Freeman, John Little Survey, Abstract 37, Anderson County wildcat 3 miles southeast of Brushy Creek, having been unsuccessful in recovering stuck drill pipe and fishing tools, is dry at 12,686 ft.

Smithland field, Marion County, had four completions this week and Calvert field, Robertson County, and Hawkins field, Wood County, had two each. Talco field, Titus County, and Hawkins field, each had three locations and Carthage field, Panola County, had two. Carthage field has 32 drilling wells, Hawkins field 20 and New Hope field, Franklin County, and Sand Flat field, Smith County, each five.

EASTERN TEXAS WILDCAT FAILURES

Cass County: W. B. Hinton 1 J. O. Betts, A. S. Beard Sur., 4 mi. SW Marietta, elev. 302 ft., Paluxy 5,052 ft., Pettit 7,593 ft., Travis Peak 7,715 ft., dry, TD 7,810 ft.

Robertson County: O. B. Perot 1 C. P. Briggs, T. J. Chambert Sur., 8 mi. NW Calvert, elev. 356 ft., dry in Nacatoch, TD 2,180 ft.

SOUTHWEST TEXAS

Second Producer Completed In Cortez Field

CORPUS CHRISTI.—The second producer for the recently discoverd Cortez field, located between Boyle and Garcia fields, in Starr County, is W. H. Holland 2 Roos-Bennett, which flowed an initial production of 66 bbl. of oil per day through ¼-in. choke, with tubing pressure 550 lb., casing pressure 800 lb., gravity 22°, no water, with gas-oil ratio 4,000 to 1. Total depth is 3,006 ft., and production is through perforations in the discovery sand topped at 2,910 ft. This well is 933 ft. southwest of the discovery, in Share 100, Porcion 93.

Jones & Morgan 1 Merrill, extension well at West Sinton field, San Patricio County, was completed for a gage of 2,302,560 cu. ft. of dry gas per day through a ¼-in. choke, with shut-in pressure of 1,610 lb. Estimated open flow per day is 66,000,000 cu. ft. Total depth is 3,390 ft., and production is through perforations at 3,385-88 ft.

Stanolind Oil & Gas Co. 1 L. A. Reagan, outpost test southwest of Oakville-Wilcox gas-condensate production, drilled plugs to perforate for production test in the Wilcox zone for probable oil discovery well in this field. Total depth is 6,738 ft. with 7-in. casing on bottom. On 40-minute drill-stem test at 6,733-36 ft. well recovered 1,430 ft. of 36°-gravity oil.

C. W. Voyles 1 Moncure Estate, wildcat 4 miles southwest of Bastrop, in Bastrop County, was completed dry at total depth of 3,579 ft. after failing on a production test in the Edwards lime at 3,479-86 ft. A drill-stem test at 3,479-83 ft. had recovered some oil and gas-cut mud. After deepening to 3,486 ft. acid was used, but the well swabbed only mud and acid water on test, no shows. A light showing of oil and gas-cut mud also had been tested in the top of the Georgetown lime at 3,375-90 ft. but no test was made. It is reported that Voyles is getting ready to start his second test in this area.

Eight wildcat locations were reported this week, one each in Bee, Brooks, Caldwell, Karnes, Kleberg, Nueces, Webb and Zapata counties. Refugio County shows the greatest activity with six new locations reported with Bexar and Duval next with four, and Live Oak and Nueces each received three locations. Thirty completions were reported with one successful wildcat in Webb County, and 11 dry wildcats, 2 in Zapata, and 1 each in Bastrop, Bee, Jim Hogg, Karnes, Medina, Milam, Starr, Travis, and Webb counties.

SOUTHWEST TEXAS SUCCESSFUL WILDCAT

Webb County: New gas pool—Dulaney Oil Co. 3 State of Texas, State Sur. 838, 1 mi. SW of Aviators field, top of pay 1,501 ft., TD 1,560 ft., producing through open hole 1,501-60 ft., no shots, PT estimated 250,000 cu. ft. of gas per day on open flow, shut-in pressure 50 lb., no water.

SOUTHWEST TEXAS WILDCAT FAILURES

Bastrop County: C. W. Voyles 1 C. L. Moncure Est., in M. Rosseau Sur., 4 mi. SW of Bastrop, dry, TD 3,579 ft.

Bee County: W. C. McBride, Inc., 3 L. N. Connally, in T. Molina Survey, 4½ mi. NE of Beeville, dry, TD 3,943 ft.

Jim Hogg County: Humble 6-B Mestena O. & G. Co., Section 4 of Fowler & Rankin Subdivision of Palitos Blancos Grant, dry, TD 5,175 ft.

Karnes County: Seaboard Oil Co. of Dela. 1 V. S. Kawolik, Antonio Hernandez Sur., 2 mi. NW of Panna Maria, dry, TD 6,005 ft.

Medina County: Woodrow Glasscock 1 Carle Mercantile Co., John Twchig Sur. 1111, 8 mi. W of Yancey, dry, TD 2,412 ft.

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Milam County: W. F. Glenn 3 J. S. Jacob, in Jose Leal Grant, 3 mi. SE of Minerva, dry, TD 1,124 ft.

Starr County: Coastal Refineries, Inc. 1 P. G. De Saenz, Porcion 107, 20 mi. NW of Rio Grande City, dry, TD 4,538 ft.

Travis County: L. M. White 1 W. R. Nabors, in G. Gates Sur., 1½ mi. NE of Manor, dry, TD 897 ft.

Webb County: Seaboard Oil Co. of Dela. 1 Donato Benavides, Survey 1602, 4 mi. N of Pescadito, dry, TD 3,166 ft.

Zapata County: C. H. Lewis 1 A. M. Bruni Est., J. V. Borrego Grant, 12 mi. S of Aguillares, dry, TD 2,301 ft.

J. O. Moss et al 2 Amelia De Vela, El Grullo Grant, 18 mi. NE of Zapata, dry, TD 783 ft.

SOUTH LOUISIANA

New Oil Field Indicated For Beauregard Parish

NEW ORLEANS.—A new oil field is indicated for Beauregard Parish by Magnolia Petroleum Co. 1 Powell Lumber Co., 2 miles northwest of the North Oretta discovery, and in 17-6s-11w. Operators are making an initial test for production in the Cockfield through casing perforations shot from 8,414-22 ft. Total depth is 8,920 ft.

Sohio Petroleum Co. 1-A W. L. Trimble, wildcat test on the west side of the China discovery area of Jefferson Davis Parish, SE NW 2-8s-4w, is preparing to make tests of some showings above the perforations at 9,180-86 ft. where it flowed salt water. Perforations have been squeezed for further testing.

The Union Oil Co. of California 1 R. R. Barrow, Inc., a semiwildcat extension test to production at Houma field, Terrebonne Parish, just east of Houma townsite, in 1-17s-18e, is ready for a production test after drilling cement plug from 5½-in. oil string set at 10,402 ft. Hole is bottomed at 10,498 ft.

Another test ready for production test is the California Co. 4 E. P. Brady, Unit 4, a deep wildcat test in the Alliance area, 19-16s-24e, several miles south of the Bayou de Fleur field area of Jefferson and Plaquemines parishes. Total depth is 11,201 ft. and the 5½-in. casing has been cemented to the bottom and preparations are being made to perforate for an initial production try. The Alliance area is separated by a dry hole from production in the Bayou de Fleur area.

A new 10,000-ft. wildcat test in the Creole area of Cameron Parish is scheduled to start operations immediately. Claude F. Morgan 1 Arthur Murphy, located in the NW 31-14s-8w, is the new test, and is ¾ mile north of his 1 LeBlanc Heirs, dry hole.

There were 14 new locations reported this week. Three wildcats were included in the nine completions with one new oil sand for New Iberia field in Iberia Parish, and Jefferson Davis and Washington parishes each receiving one dry wildcat. Iberia and Jefferson parishes shared the lead with two completions each.

SOUTH LOUISIANA SUCCESSFUL WILDCAT

Iberia Parish: New oil sand in New Iberia field—Humble 2 Mrs. Cecile W. Germany et al, 2-12s-7e, TD 10,196 ft., top sand 9,905 ft., perf. 9,905-16 ft. with 16 holes, PT 297 bbl. per day through 10/64-in. choke, gas-oil ratio 610 to 1, TP 1,350 lb., gravity 33°, no water.

SOUTH LOUISIANA WILDCAT FAILURES

Jefferson Davis Parish: Barnsdall Oil Co. 1 Powell Lbr. Co., 31-7s-4w, in Langley area, dry, TD 8,745 ft.

Washington Parish: Humble 1-B Gaylord

Container Corp., 42-1s-14e, in Angie area, dry, TD 12,006 ft.

CALIFORNIA

First Wells Completed in Wilmington 237 Zone

LOS ANGELES.—The first batch of new wells in the 237 zone at Wilmington have already been completed or are in process of being finished and hooked up and from now on completions will be spaced farther apart. There are about 75 locations susceptible of development in the 237 zone but this number may vary to some extent as this sand is producible in both blocks 3 and 4 and the exact limitation of the zone has not been determined at all points.

Due to inabiltiy or natural gasoline plants to handle maximum rates of all wells, operators have found it necessary to aribitrarily reduce daily production rates to 900 bbl. per day. Most wells have been reduced to this maximum but there are still a number of wells exceeding the 900 bbl. daily maximum. It is quite likely that 237 zone wells will have to be reduced to about 750 bbl. per day very shortly in order to maintain the gas volume at about the present level.

Completions in the 237 zone at Wilmington averaged better than one a day during the last week in June and continued the rate during the early part of July. Completion tables do not adequately reflect the total number of completions as some of these wells are redrilling jobs or wells that have been deepened from some upper zone. Redrilling and deepening jobs are considered workovers and do not appear in completion tables of new wells. There are 22 drilling wells in this field which have the 237 zone as the objective but they will not be finished for another 3 weeks. Some of these drilling jobs are recent spuds and some are farther along so that they will be completed over a longer period of time. The 237 zone is at present producing 30,000 bbl. per day and Wilmington field production has risen to 125,000 bbl. daily.

The tightness of wet gas outlets is due to the fact that the tar sand, Ranger sand, upper and lower Terminal sands, The Union Pacific sand and the Ford zone have shown high initials of oil but comparatively small quantities of natural gas. The 237 zone, on the other hand, shows higher gas-oil ratios and consequently original absorption facilities have been found inadequate to handle the greatly expanded production of wet gas. The present gas-oil ratio varies from 1,000 cu. ft. to 4,000 cu. ft. per barrel of crude and while this is not high the multiplicity of completions in the 237 zone has practically trebled gas production in a comparatively short time.

The joint project which Shell is drilling for six major companies on fee-owned acreage between El Segundo and Playa Del Rey has reached the critical depth of 6,939 ft. This test of which much was expected has not offered any encouragement and at the present depth looks bad. The overlying conglomerate showed a few colors but the recovery on a formation test consisted of a weak blow for a few minutes and 200 ft. of drilling mud. The formation at present is basement schist and while the upper few feet showed some colors there has been no substantial oil showing and the hole appears dead. Unless some weathered schist is found very shortly this wildcat may be an early abandonment. Failure of this test to produce commercially does not condemn the entire area although it does take the edge off a district that showed more than ordinary merit prior to drilling. It is interesting to note that Shell's test has not showed as much promise as a wildcat drilled a year or two ago by Edwin and Harold Pauley on the Hyperion sewer farm about ¼-mile from Shell's location. The next location will probably be east and south of the present test.

Drilling operations involving schist development at Edison appear to be leveling off and henceforth completions will be relatively few. There are five schist zone wells being prepared for production tests and they should be completed within the next 10 days. A total of 92 wells have been finished in the fractured schist at Edison but most of them are only producing a small part of their respective potentials. Drilling from here on out will be at a lower level unless some additional extension is opened up which seems improbable at present.

Locations in the state this week were slightly lower than completions but this is only a temporary condition and the disparity reflects an abnormal number of completions in the Wilmington field. With a leveling off in drilling in some fields and a maintenance of work in others it would appear quite probable the amount of work may drop off slightly. It remains to be seen whether reduced drilling at Edison and Cymric will be counterbalanced by increases in the 237 zone at Wilmington.

CALIFORNIA WILDCAT FAILURES

Solano County, Potrero Hills: Standard 1 Scally Estate, 10-4n-1w, bottomed in gray sand, top Meganos 900 ft., no showings, drilled as test for natural gas, TD 2,500 ft.

Tulare County, Sunnyvale: Shell 14-1 Sunnyvale Comm., 29-23s-26e, bottomed in basement, form. test 4,713-4,825 ft. recovered 2,000 ft. mud and fresh water, TD 4,825 ft.

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TEXAS GULF COAST

New Deep Sand Found in Stratton Ridge Field

HOUSTON.—A new deeper sand for the Stratton Ridge field in Brazoria County has been opened by E. Cockrell 5 Seaburn Estate Heirs, located in the Jared E. Groce 5 League. Drilled to a total depth of 4,640 ft., with 7-in. casing set to 4,582 ft., the well flowed a potential of 147 bbl. of 29°-gravity oil per day through a 10/64-in. choke, gas-oil ratio 520 to 1, tubing pressure 535 lb., no water in the flow. Top of sand was logged at 4,567 ft., base at 4,586 ft. Production is through 28 perforations at 4,576-81 ft.

Indications are that a new gas-condensate pool will be opened by Houston Oil Co. of Texas at 1 Houston Oil Co. and American Republics Corp., in the Thomas Penny Survey, Abstract 424, 3 miles southwest of production in the Village Mills field, Hardin County. Operators made a drill-stem test from 8,928-40 ft. and recovered 18 stands of distillate-cut water cushion and two stands of distillate-cut mud. Then the well blew an additional 14 stands of distillate and wash water when tool was pulled. Hole is being cored ahead from 8,953 ft. in sand and shale.

The Fig Ridge field has been extended to the north by Sun Oil Co. 5 Federal Land Bank, which flowed 251 bbl. of 35°-gravity oil per day through a 10/64-in. choke through 12 perforations at 8,495-98 ft. Flowing pressure was 1,000 lb. on tubing. Gas-oil ratio was 570 to 1. This well is in the T&NO Survey, Section 81, 1,218 ft. northeast of 1 Sterling, on north edge of the field.

A new deep pay has been indicated at Pierce Junction field in Harris County, by Gulf Oil Corp. 2 C. S. Settegast et al, in Jos. Kopman Survey, Abstract 85. On an initial test of perforations at 8,356-72 ft. the well blew gas for 5 minutes, then choke at the bottom clogged up. After rerunning testing tool for a good test, hole was swabbed to 7,000 ft. and it started flowing some oil and wash water when production packer gave way. Operators are preparing to test again.

Wirt Franklin Petroleum Co. 1 W. T. Voulding, a west extension test to the Hillje field in Wharton County, is reported to be in oil sand at 5,210-14 ft. where perforations are being made for a production test. Total depth is 5,230 ft., and 5½-in. casing is set on bottom. Test is located in Morris & Cummings Survey, Section 1.

Gas-cut mud with a slight show of oil and seven stands of sulfur water were recovered on test made through upper perforations at 9,714-28 ft. in Floyd L. Karsten 1 J. J. Menke (Chapman), wildcat test in the Hempstead area, Waller County. A bottom-hole pressure of 2,500 lb. was recorded. Operators are preparing to make another test, with top of perforations at 9,910 ft.

Four wildcat tests were included in the 13 new locations reported this week, one each in Brazoria, Fort Bend, Grimes and Hardin counties. Brazoria County received four locations while Matagorda and Jackson counties each received two. Stratton Ridge field in Brazoria County received a new oil pay, and one dry wildcat was shown for Wharton County. Brazoria and Jackson counties each received two completions.

UPPER GULF COAST TEXAS SUCCESSFUL WILDCAT

Brazoria County: New oil pay in Stratton Ridge field: E. Cockrell 5 Seaburn Est. Hrs., Jared E. Groce 5 League Grant, TD 4,640 ft., top sand 4,567-86 ft., perf. 28 holes 4,576-81 ft., PT 147 bbl. per day through a 10/64-in. choke, gas-oil

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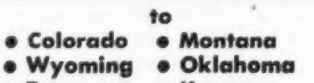

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ratio 520 to 1, TP 535 lb., gravity 29°, no water.

UPPER GULF COAST WILDCAT FAILURE

Wharton County: Shanghai Ltd. 1 Joe Adamcek, SA&MG RR Co. Sur., 3 mi. N of Hillje townsite, dry, TD 5,020 ft.

N. CENTRAL TEXAS

First Well Completed in Rose Pool Extension Area

WICHITA FALLS.—Thomas D. Humphrey 2 M. A. Smith, James M. Cass Survey No. 57, Abstract 95, in the new extension area of the Rose pool in Haskell County, 6 miles east of Haskell, has been completed to flow 660 bbl. of oil in 24 hours. Production is coming from 2,845-47 ft. The official test was based on a 3-hour gage of 88½ bbl. of oil flowing through ¾-in. choke. Gas-oil ratio was 300 to 1. This is the first official completion for the area, though 1 Smith has been estimated to have production possibilities of 2,000 bbl. a day. It is waiting for official test. Another test being drilled is 1 Anthony. Oil string was set at 2,794 ft. after 1 ft. of the pay zone had been drilled from 2,794-95 ft.

Cities Service Oil Co. 1 Mrs. Doris Mulkey, Section 163, Block 44, H&TC Survey, wildcat 2 miles south of Truscott, the first oil producer in Knox County, has been unofficially completed to pump 10 bbl. of 41°-gravity oil in 24 hours. It was completed after considerable mechanical difficulty from perforations from 6,224-47 ft.

National Associated Petroleum Co. 1 J. E. Lockett is a new 5,800-ft. wildcat for Wilbarger County, 1 mile south of Lockett. It is 990 ft. from the east and 330 ft. from the south line of Section 27, Block 9, H&TC Survey. It is also 2 miles west of 1 Schmoker, recent Canyon lime discovery well 6 miles southeast of Vernon, which was carried to 5,728 ft. where it showed salt water in the Ellenburger.

Wilson field, Cooke County, had four completions this week and Sivell's Bend and Gatewood fields, Cooke County, and Electra and Sunshine Hill fields, Wichita County, each had three. Electra and Madison fields, Wichita County, had three locations and Holliday field, Archer County, and Sivell's Bend field each had two. Wilson field has seven drilling wells, National field, Wilbarger County, and Sivell's Bend field each six; Cooper field, Archer County, five, and Hildreth field, Montague County, four.

In West Central Texas, Noodle field, Jones County, Shackelford County Regular field, Jones County Regular field and Stephens County Regular field each had one completion. Jones County Regular field had two locations. Silver Valley field, Coleman County, and Lewis Steffins field, Jones County, each have three drilling wells; Cisco field, Eastland County, Loving field, Stephens County, and Reddin field, Taylor County, each two.

NORTH CENTRAL TEXAS WILDCAT FAILURES

Archer County: Grace & Grace 4 M. Wear, Blk. 8, Crawford Subd., I. Holman Sur., 7 mi. W Olney, elev. 1,297 ft., dry, TD 1,318 ft.

L. M. Price 1 Mrs. Mary Pechacek, M Fanning Sur. A-128, 5 mi. E Holliday, dry, TD 470 ft.

F. P. Timberlake & Kelleher 1 L. F. Wilson, Sec. 32, ATNCL Sur., 6 mi. N and ¼ mi. E Archer City, dry, TD 1,617 ft.

W. C. Young 2 W. C. Jones, Sec. 1840, TE&L Sur., 9½ mi. E Anarene, dry, TD 977 ft.

Cooke County: Akin & Dimock 1 E. G. Ramsey, R. E. Parks Sur. A-1213, 3 mi. W Marysville, dry, TD 1,450 ft.

Barker & Blaine 1 O. Wilson, E. Reed Sur. A-848 ft., 2 mi. NE Muenster, elev. 936 ft., dry, TD 995 ft.

H. D. Egger 1-A Milton Wade, Sec. 1, ETRR Sur., 3 mi. E and 6 mi. S Gainesville, dry, TD 2,000 ft.

Frederick Electric Co. et al 1 John Streng, SPRR Sur. A-975, 3 mi. S and 2½ mi. W Muenster, dry, TD 1,202 ft.

Harvey Drlg. 1 J. Mitchell, B. B. Lee Sur. A-614, 5 mi. W and 4 mi. N Muenster, dry, TD 2,320 ft.

Texas 1 R. W. Huchtons, H. O. Kohlman Sur. A-554, 2½ mi. W and ½ mi. S Muenster, elev. 1,068 ft., dry, TD 2,680 ft.

Wichita County: D. H. Bolin 1-A J. M. Goins, Blk. 48, Red River Valley Lands, 5 mi. W Burkburnett, dry, TD 2,022 ft.

Bolin 1-B Goins, Blk. 47, Red River Valley Lands, 5 mi. W Burkburnett, dry, TD 2,000 ft.

McLaughlin & Galley 1 Schaffike & Towles, Sec. 1, SA&MG Sur. A-275, 3 mi. E Electra, dry, TD 2,000 ft.

Schram & Wolfe 1 R. Lee Kemper, Blk. 58, KWVFL Sur., 2 mi. NW Holliday, elev. 1,042 ft., dry, TD 710 ft.

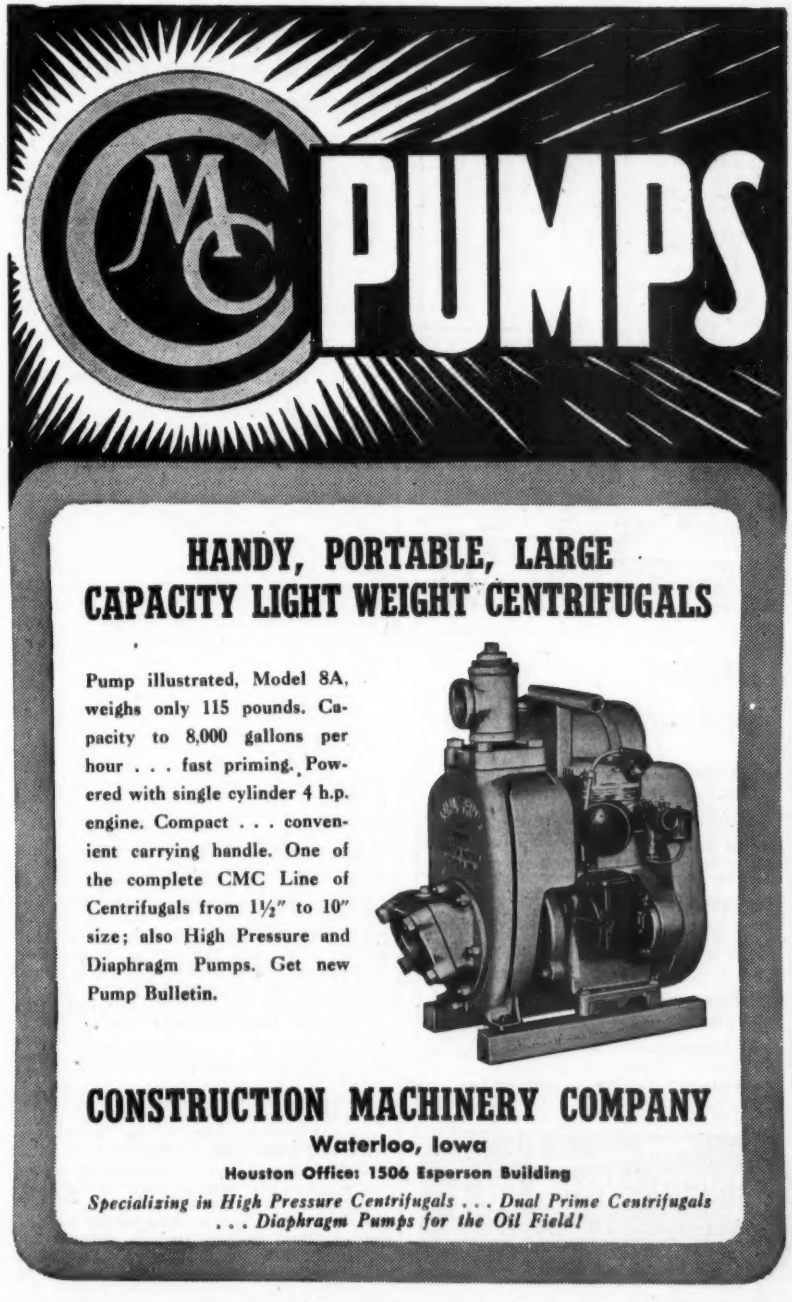
Young County: Alex McCutchin Drlg. 2 Williamson Est., Sec. 286, TE&L Sur., 2 mi. S and 1 mi. W Jean, dry, TD 2,992 ft.

WEST CENTRAL TEXAS SUCCESSFUL WILDCAT

Coleman County: New gas pool—H. T. Owens & Rhodes Drlg. 1 J. D. Gorman, Sec. 31, Blk. 2, T&NO Sur., 3 mi. SW Novice, elev. 1,993 ft., flowed 2,500,000 cu. ft. gas day, perf. 3,714-22 ft. Gardner, TD 3,728 ft.

WEST CENTRAL TEXAS WILDCAT FAILURES

Callahan County: R. B. Tamblyn Develop-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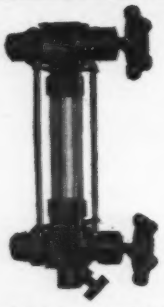

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ment Co. 1 J. M. Harlow, Walter Converse Sur. No. 333, 2 mi. N Cross Plains, elev. 1,738 ft., dry, TD 1,732 ft.

Coleman County: Brannon & Murray 1 G. L. Joyce, J. Greenwood Sur. 304, 3¾ mi. NE Talpa, elev. 2,106 ft., dry in Canyon, TD 2,647 ft.

Jones County: Oscar Donley 1 Mrs. M. E. Mullins, Sec. 43, OAL Sur., 4½ mi. NW Nugent, elev. 1,733 ft., dry, TD 2,478 ft.

Taylor County: Great Lakes Carbon Corp. 1 H. D. Hopkins, Sec. 21, SPRR Sur., 3¾ mi. SE Tye, elev. 1,791 ft., Bunger 2,644 ft., dry, TD 2,760 ft.

West Central Drlg. 1 L. N. Brown, Subd. 2, Jose Gabo Sur. No. 128, ½ mi. NW Tye, elev. 1,806 ft., dry, TD 2,385 ft.

West Central et al 1 W. W. Harp, Jno. McSherry Sur. No. 129, 2½ mi. SW Tye, Upper Hope 2,477 ft., dry, TD 3,105 ft.

ROCKY MOUNTAIN

East Lance Creek Field Gets Record Producer

DENVER.—The largest producer so far completed in the East Lance Creek field, which lies 3 miles to the east of Lance Creek, and which has been under development for the past several years with little publicity, is Continental Oil Co. 1 Bowman, SE NE SE 26-36n-64w, which flowed 216 bbl. in 5½ hours through a 5/8-in. choke, or at the rate of 984 bbl. per day. Production is from the Dakota through perforations at 3,850-60 ft. Seventeen wells have been drilled since the area was unitized with Continental as the operator. The field is rather spotted with five dry holes. The Bowman well is an outpost on the south in a group of wells drilled in Sections 25 and 26, where only 1 dry hole was encountered, this being on the west side of the group and east of the other wells. One deep test went 65 ft. into the Madison at a total depth of 6,434 ft., and was plugged back and completed in the Dakota for 8,600,000 cu. ft. of gas per day. This well is in the NE NE 29-36-64, with a Dakota sand producer on the west and a dry hole two locations to the south. The field produced 85,000 bbl. last year, with cumulative production of 355,000 bbl.

Carter Shawnee test.—Carter Oil Co. 1 120C, C SW NW 19-33n-68w, Shawnee district, Converse County, Wyoming, a wildcat out in the Powder River Basin on the south side, had the top of the Dakota at 11,550 ft. A 9-ft. core taken at 11,560-69 ft., all recovered from the Dakota formation, showed shale, sandy shale and silt stone with a few gas bubbles. It then cored from 11,569 to 11,577 ft., recovering 2 ft. of sand and shale with silt streaks and no shows. It is reaming to drill ahead and may go to the Sundance at around 14,000 ft., which will establish a new depth record for the Rocky Mountain area. A drill-stem test at 8,850 ft. with two packers, hook wall and formation, open 3 hours, showed gas to the top of the hole in 65 minutes. It then settled to the rate of 50,000 cu. ft. per day. The recovery was 20 stands of gas-cut mud in addition to 15 stands of water cushion. This probably was in the Frontier. This is the first deep test to be drilled out in the Powder River basin, which compares in area with the Big Horn Basin in northern Wyoming.

Gas well in Blanco district.—Florence Drilling Co., drilling on the William Mansfield 12,000-acre block in the Blanco district, San Juan County, New Mexico, completed a gas well for 1,500,000 cu. ft. per day in the Farmington sand at 1,927 ft., total depth, in 3 Mansfield-Federal, SE NW NE 29-30n-9w. It was allowed to blow 7 days without any appreciable decrease in pressure which was 600 psi. A series of slim-hole rotary tests are being drilled on the block preliminary to locating a test to the Dakota. Another well is drilling in NW NE NE Section 29. The well is located ¾ mile north and west of the Huntington Park well drilled in 1925 to 4,550 ft. which had 600,000 cu. ft. of gas in the Mesa Verde at 4,152-57 ft., 200,000 cu. ft. in the Picture Cliff at 2,228-45 ft., and a small quantity of oil in the Farmington sand. This well has supplied the town of Aztec with gas since 1929.

Dry hole at Table Rock.—Texas Co. 2 Unit, C NW NW 31-19n-97w, Table Rock structure, Sweetwater County, Wyoming, was dry at 4,106 ft. The location is 1¼ miles northeast of 1 Unit, a gas discovery in a sand in the Laramie beds of Upper Cretaceous last April at 3,831 ft., total depth. The discovery tested 5,692,000 cu. ft. with a shut-in pressure of 1,225 psi. The block consists of 15 sections in the unit, the Union Pacific Railroad being owner of one-half interest in the unitized area.

River Dome.—Pure Oil Co. 2 Unit, NE NE NW 12-48n-92½w, River Dome district, Washakie County, Wyoming, topped the Embar at 10,276 ft., and is drilling ahead at 10,283 ft. It is located a little more than a mile to the northwest of the discovery well in the Embar, which still is testing. The second well ran approximately 216 ft. lower on the Embar than the discovery. No. 1 Unit is still testing, flowing 1 bbl. per hour with 250,000 cu. ft. of gas and has not yet been acidized.

New operations.—Fourteen new operations were reported, of which 2 were in Colorado, both in the Rangely field; 2 in Wyoming, one in Oregon Basin and the other a wildcat by the Texas Co. on Mill Creek in Carbon County; 7 in Montana, 2 each in Cat Creek, Cut Bank and Kevin-Sunburst, and 1 in the Bowdoin gas field. The wildcat is Texas Co. 1 Unit, NE NE SE 14-20n-81w, Mill Creek structure, Car-

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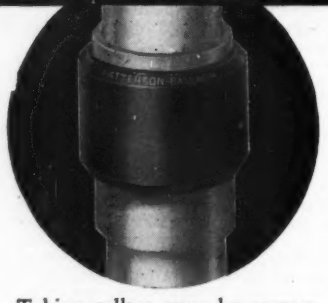

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bon County. Of three wells drilled in the vicinity, the deepest went to the Sundance at 4,803 ft.

Completions.—There were 12 wells completed, of which 7 were oil wells with initial production of 3,127 bbl., 3 were gas wells and 2 were dry holes. Five of the oil wells were in the Rangely field in Colorado, initial production 2,056 bbl. Three completions in Wyoming included 1 oil well for 984 bbl., 1 dry hole in Rock River and 1 dry wildcat. Montana had 1 oil well in Cut Bank for 87 bbl., and a small gas well in the Bowdoin field. New Mexico had two gas wells, one in Fulcher Basin and one near Aztec.

WYOMING WILDCAT FAILURE

Table Rock, Sweetwater County: Texas Co. 2 Unit, C NW NW 31-19n-97w, TD 4,106 ft., dry in Laramie beds.

ILLINOIS

Wayne County Discovery Well Plugging Back

MATTOON.—The Deep Rock Oil Corp. 1 Ulysses, NE NW NW 30-1n-6e, Wayne County discovery about 2½ miles west of the Johnsonville pool, is now plugging back to test the McClosky lime at 3,151-57 ft. Previously, after casing had been set and plug drilled, the well flowed 60 bbl. of oil the first hour. Production declined rapidly, however, and the well produced only 104 bbl. in 24 hours following a 1,000-gal. acid treatment. Operators then drilled ahead to 3,178 ft., total depth, and got water. They are now plugging back to 3,159 ft. to retest the original pay section.

The Deep Rock 1 Spicer, SW SW NE 25-1n-5e, recently completed as an extension well of McClosky production in the West Johnsonville pool is about ¾ mile southwest of the present test. The area around these two wells appears to hold promise of good commercial oil wells, but as yet it has not developed into a real oil field.

The area just slightly west of the scattered pools of the Allendale area is showing a considerable increase in activity during recent weeks due to good production being found in the Biehl (Pennsylvanian) sand at a shallow depth. Most recent completion is the Fred Heldt 1 George Price, SW SW NE 12-1n-13w, Wabash County, which made 175 bbl. daily from the Biehl sand at 1,640-50 ft., total depth 2,356 ft. There are now five active operations and two locations in this area.

In Bond County, Walter Duncan and Paul Doran are moving in cable tools to drill plug on the Trenton at 2,700-35 ft., total depth, at their wildcat, the 1 T. S. Root, SE SE NE 16-6n-4w. No drill-stem test has been made on this well, but it is believed that some saturation was encountered.

A rank wildcat in Cumberland County, the Central Pipe Line 1 S. Meyers, SE NW SW 36-9n-9e, was successfully completed during the past week to flow 15 bbl. of oil daily from two sections in the Rosiclare at at 2,648-54 ft. and 2,657-64 ft. Total depth is 2,776 ft. and the well was treated with 2,500 gal. of acid.

Other completions in the state during the week included 24 oil wells and 16 dry holes, 6 of which were dry wildcats. Exploratory drilling activity continued its upward trend with 18 wildcat tests announced. Total new operations reported for the week amounted to 50 wells.

ILLINOIS SUCCESSFUL WILDCAT

Cumberland County: Central Pipe Line 1 S. Meyers, SE NW SW 36-9n-9e, pumped 15 bbl., 800 gal. acid, reacidized 2,000 gal., Rosiclare 2,648-54 ft., 2,657-64 ft., TD 2,776 ft.

ILLINOIS WILDCAT FAILURES

Hamilton County: Claude Neon Light 1 Seng, NW SW NW 27-4s-5e, dry at 3,470 ft., Tar Springs 2,565 ft., Glen Dean 2,667 ft., Hardinsburg sand 2,721 ft., Cypress sand 2,791 ft., Benoist sand 3,107 ft., Renault 3,203 ft., Aux Vases sand 3,234 ft., Ste. Genevieve 3,271 ft., Levias 3,290 ft., Rosiclare 3,305 ft., McClosky 3,372 ft.

Madison County: Jarvis & Marcell 1 A. Hitz, NW NE SE 8-5n-5w, dry at 2,797 ft., Rosiclare 920 ft., St. Louis 975 ft., Louisiana 1,815 ft., Chattanooga 1,882 ft., Devonian 1,916 ft., Trenton 2,692 ft.

Marion County: Reward Oil Co. 1 O. Krug, SW NE SW 7-4n-3e, dry at 3,201 ft., Glen Dean 2,576 ft., Cypress sand 2,762 ft., Renault 3,013 ft., Aux Vases sand 3,024 ft., Ste. Genevieve 3,096 ft., Fredonia 3,134 ft., McClosky 3,135 ft.

Shelby County: Texas 1 A. Mietzmer, SW SW NE 5-9n-5e, dry at 2,214 ft., Rosiclare 2,039 ft., Fredonia 2,076 ft., McClosky 2,083 ft.

Wayne County: Robinson & Puckett 1 Hale, NE NE NE 19-2n-7e, dry at 3,201 ft., Glen Dean 2,576 ft., Cypress sand 2,762 ft., Renault 3,013 ft., Aux Vases sand 3,024 ft., Ste. Genevieve 3,096 ft., Fredonia 3,134 ft., McClosky 3,135 ft.

White County: C. A. Lynch 1 H. & F. Golden, NE SE SE 21-5s-14w, dry at 2,742 ft., Kincaid 1,840 ft., Menard 2,186 ft., Vienna 2,316 ft., Tar Springs sand 2,366 ft., Glen Dean 2,452 ft., Golconda 2,554 ft., Barlow lime 2,672 ft., Cypress sand 2,717 ft.

OHIO, KENTUCKY

New Oil Field East of Sandyville Confirmed

COLUMBUS.—The first oil pool to be found east of the Sandyville field was confirmed by the completion of the second test, ¼ mile northeast of the discovery. The producer, Belden et al 1 S. S. Fry, Section 13, Pike Township, Stark County, was drilled through the white Clinton at 5,004-49 ft. and after shot swabbed 120 bbl. in 24 hours. Hanley & Bird in a 1-mile move to the west of the Sandyville field, found a small gas well on Elmer Indorf, Section 14, Perry Township, Stark County. Stray Clinton, 4,436-58 ft. and white Clinton, 4,496-524 ft., gaged 180,000 cu. ft. and shut in after shot at 464,000 cu. ft.

Frank Lyons completed his 1 Thos. Carse, Section 26, Jackson Township, Ashland County, as a combination oil and gas well, and has moved his machine 1 mile north for another test. The well is flowing an estimated 100 bbl. per day.

The Somerset area had two good oil completions for the week. John Morrow et al 1 Anna P. Beard, Section 33, Madison Township, Perry County, made 90 bbl. from Clinton at 3,235-81 ft. Four Way 6 Albert Sturgeon, Section 23, Hopewell Township, flowed 80 bbl. from Clinton at 2,926-66 ft.

New locations and completions hit a new high this week. Thirty-two locations were divided almost evenly over the fields, and of the 36 completions, Cambridge reported 11, Lancaster 8, Sandyville 6, Ashland 5, Stewart 3, Brush Creek 2, and Mt. Vernon 1.

OHIO WILDCAT FAILURE

Medina County, Homes Township: Wasson & Co. 1 Edna Schott, Sec. 7, Clinton 2,832-37 ft., TD 2,908 ft.

WESTERN KENTUCKY

OWENSBORO.—No important developments were noted in the Western Kentucky area during the past week as operators completed eight dry holes, four of which were wildcats, and two oil wells. Activity showed a slight increase, however, as 13 new tests were announced. Seven of the new operations were located in Henderson County and one each in Union, Metcalf, Daviess, Mead, Butler, and Barron counties.

WESTERN KENTUCKY WILDCAT FAILURES

Daviess County: M. B. Daly 1 Brooks Heirs, 6-N-29, elev. 394 ft., dry at 1,777 ft., Glen Dean 1,252 ft., Ste. Genevieve 1,648 ft., McClosky 1,707 ft.

Henderson County: Neely-Zogg 1 Cosby, 6-O-26, dry at 632 ft.

Muhlenberg County: Ryan Oil 1 S. T. Smith, 15-J-31, elev. 447 ft., dry at 2,031 ft., Glen Dean 1,510 ft., Cypress 1,733 ft., Ste. Genevieve 1,960 ft.

Union County: Sun Oil 1 T. E. Willett-M. L. Byrne, 2-O-21, elev. 383 ft., dry at 2,703 ft., Menard 1,702 ft., Glen Dean 1983 ft., Barlow 2,249 ft., Ste. Genevieve 2,557 ft.

EASTERN KENTUCKY

ASHLAND.—Three gas completions, one of them dry, and six oil well completions with two for light showing, were noted in the eastern Kentucky field of operations during the past week.

Kentucky-West Virginia Gas Co. completed well No. 5661 on the T. G. Bates property, Knott County, total depth 1,017 ft., with an open flow of 245,000 cu. ft. of gas.

Kentucky-West Virginia Gas Co. completed well No. 5641 on the William Hamilton property, Floyd County, total depth 3,239 ft., with an open flow of 82,000 cu. ft.

Patterson, Dyer & Rader completed 4 wells: No. 4 on the Bingham farm, Jackson County, 1,193 ft., 20 bbl.; No. 3 on the Reed farm, Jackson County, 1,104 ft., 1 bbl.; No. 6, Flanery farm, Jackson County, 1,111 ft., 3 bbl., and No. 5, Flanery farm, Jackson County, 1,094 ft., 1 bbl.

INDIANA

EVANSVILLE.—The Carter Oil Co. 1 John Larkin, SE NE SW 17-6s-14w, Posey County wildcat which made 2½ bbl. of oil on a 13-hour test of the Aux Vases sand at 2,791-2,803 ft., was deepened to 2,944 ft. during the past week for a test of the McCosky at 2,926-28 ft. and 2,940-44 ft. No additional shows of oil were found in the McClosky and operators are now plugging back to retest the Aux Vases.

Continental's deep test in the Griffin pool of Gibson County, the 1-D Cooper Estate, SW SW 13-3s-14w, is drilling ahead below 5,149 ft.

Indiana completions continued their upward trend during the past week as operators finaled seven oil wells and five dry holes. All were development wells with no wildcat completions reported. A total of 15 new operations were reported for the week, 4 in Pike County, 3 each in Gibson, Spencer, and Posey counties, and 1 each in Knox and Vanderburgh counties.

APPALACHIAN FIELD

Pennsylvania Deep Test Finds Gas in Oriskany

PITTSBURGH.—In Fairfield Township, Westmoreland County, southwest Pennsylvania, Railway Steel Spring Co. is drilling through the Oriskany sand in the wildcat on L. C. Steiner farm and have a gage of 143,000 cu. ft. gas, natural. From a surface elevation of 1,463 ft. the Onondaga chert was topped at 7,808 ft., Oriskany 8,005 ft., show gas 1 ft. in sand with 143,000 cu. ft. gas at 8,009 ft. It is drilling at 8,020 ft. with no added gas. This places the top of the Oriskany 6,542 ft. below sea level and it is about the deepest Oriskany gas subsea in Appalachia. It is possible that the "B" member of the Oriskany may also be productive if sand conditions improve.

New locations totaled 10 scattered through

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Boggs, Cowanshannock, and South Bend townships, Armstrong County; Washington Township, Indiana County; Amwell Township, Washington County, and Bell Township, Westmoreland County.

In Crook district, Boone County West Virginia, Pond Fork Oil & Gas Co. completed 27 fee in the Big Lime gaging 1,143,000 cu. ft. gas, total depth 2,530 ft.

In Laurel Hill district, Lincoln County, United Fuel Gas Co. completed 5,687 Huntington Development & Gas Co. with a final open flow of 3,130,000 cu. ft. gas from the Big Lime, total depth 1,370 ft.

New locations for the past 2 weeks totaled 35 and were located in Boone, Braxton, Cabell, Calhoun, Gilmer, Hancock, Jackson, Kanawha, Lincoln, Mingo, Pleasants, Putnam, Taylor, Wayne, Wetzel, Wirt, and Wyoming counties.

KANSAS

Two New Oil Pools Assured By Ellis County Wildcats

EXPLORATORY drilling, which has dominated Kansas activity for several weeks, has been paying off during recent weeks with several new oil pools discovered in the state and several more indicated. Two of the new strikes are in Ellis County and both are showing good production. The W. N. Bartlett et al 1 Engle, NE NE SE 21-15s-18w, between the Ruder and Madden pools, is reported to be swabbing at the rate of 13 bbl. of oil per hour from the Arbuckle. The Arbuckle was topped 3,569 ft. and 5-in. casing was set at 3,579 ft. After drilling plug, operator acidized with 500 gal.

The other Ellis County strike is the Mazda Oil Co. et al 1 Henderson, SE NE 22-11s-18w, 1½ miles southwest of the Burnett pool and 2 miles east of the Riverview pool. This well began showing for a producer about 2 weeks ago, and on more recent tests, following a 1,000-gal. acid treatment, it swabbed oil at the rate of 145 bbl. in 5 hours. Production is from the Arbuckle topped at 3,633 ft., total depth 3,636 ft.

In Barber County, Skelly Oil Co. has begun additional tests at its 1-C Boggs, SW NE NE 17-33s-12w, after deepening to 4,842 ft. in the Simpson. At the previous total depth of 4,816 ft., the well flowed at the rate of 13 bbl. of oil in 10 hours. It is located more than a mile east of production in the Medicine Lodge field.

Cities Service Oil Co. has extended the Behrens pool of Barton County to the north with the 1 Tammen, SE SE SE 11-19s-15w. The 1 Tammen was completed flowing 536 bbl. daily from the Arbuckle.

A well which was completed as a dry hole in 1943 has been opened by the Bridgeport Oil Co. and is flowing at the rate of 113 bbl. of oil in 10 hours to open a new pool for Pratt County. The test is the 1 Stoops, SE SE SW 7-29s-12w. Production is from perforations opposite the Viola at 4,446-52 ft. The well is reported making about 2,400,000 cu. ft. of gas along with the oil. Shell Oil Co., Inc., who drilled the well originally, did not test the Viola.

KANSAS SUCCESSFUL WILDCAT

Barton County: Black-Marshall 1 Klug, SE SE SE 28-17s-13w, pumped 52 bbl. oil, Arbuckle 3,416-21 ft., TD 3,421 ft.

KANSAS WILDCAT FAILURES

Barton County: Republic Natural Gas and Gabbert Drilling Co. 1 Logan, SE SE SW 26-17s-14w, dry, TD 3,388 ft., Kansas City 3,125 ft., Arbuckle 3,357 ft.

Ellis County: Mouser Drilling and Western Exploration Co. 1 T. Moore, SW SW NW 19-14s-19w, dry, TD 3,874 ft., Kansas City 3,376 ft., slight show of dead oil in Arbuckle 3,844 ft.

Ellsworth County: Gough Davis 1 Tomsu,

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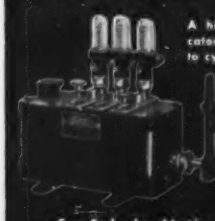

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Sedgwick County: Helmerich & Payne et al 1 Williams, SW SW SW 18-25s-2w, dry, TD 4,100 ft., Viola 3,918 ft., Simpson 3,938 ft., Arbuckle 4,042 ft.

LA.-ARK.

Increased Wildcat Activity Reported in South Arkansas

SHREVEPORT.—Wildcat activity in South Arkansas was running high last week, with 19 rigs drilling, according to the Oil and Gas Commission at El Dorado. In Nevada County, Charles F. Steele's 1 H. L. Waters, CN½ NW NE 20-14s-21w, reported oil had decreased from 30 bbl. to about 10 bbl. per day. Total depth was 2,246 ft., with perforations and casing rips at 1,207-19 ft. and 1,207-21 ft. In Union County, H. E. Wasson's 1-A Union Sawmill, SW SW NE 8-18s-12w, had total depth at 2,565 ft. in Meakin sand and was making about 2 bbl. of oil a day.

Barnsdall Oil Co.'s recent application to the Arkansas Oil and Gas Commission to classify the McKamie and Patton fields as a common source of supply was denied. The commission held McKamie to be a gas-condensate pool to be developed on a 160-acre pattern, and Patton an oil field to be developed on a 40-acre pattern.

LEGAL

U. S. DEPARTMENT OF THE INTERIOR. General Land Office, Washington, D. C. Notice is hereby given that sealed bids will be received until 1 p.m. Wednesday, July 17, 1946, for land described herein situated within the known geologic structure of the Holcomb area of the Hugoton gas field, 6th P. M., Kansas. This land is offered to qualified bidders of the highest cash amounts per acre as a bonus for the privilege of leasing the land under section 17 of the leasing act as amended by the Act of August 21, 1935 (49 Stat. 674, 30 U.S.C. sec. 226), in the following parcels: Parcel No. 1, T. 26 S., R. 34 W., sec. 6, lot 3, 98.19 acres; Parcel No. 2, T. 26 S., R. 36 W., sec. 29, N½NW¼, 80 acres; Parcel No. 3, T. 26 S., R. 37 W., sec. 10, SE¼, 160 acres; Parcel No. 4, T. 24 S., R. 33 W., sec. 18, lot 4, 35.72 acres; Parcel No. 5, T. 32 S., R. 33 W., sec. 19, lot 3, 37.53 acres; Parcel No. 6, T. 32 S., R. 34 W., sec. 25, W½NE¼, E½NW¼, NW¼SE¼, 200 acres. Total 431.44 acres. Annual rental will be at the rate of 25 cents per acre so long as the land is valuable only for gas; but upon discovery of a valuable deposit of oil within the boundaries of the known structure on which all or a part of these lands are situated, rental will be not less than $1.00 per acre. Each bidder must submit with the bid one-fifth of the amount bid in cash, or by certified check made payable to the order of the Treasurer of the United States, and file the showing of qualifications to receive a lease, required under 43 CFR 192.19. The envelopes should be plainly marked "Bid for Parcel No.——, Hugoton gas field, Kansas. Not to be opened before 1 p.m. July 17, 1946." No bids received after the hour fixed for receiving bids will be considered. The remainder of the bonus and the annual rental at the rate of 25 cents per acre must be paid and a $5,000 corporate surety bond must be furnished by a successful bidder prior to the issuance of a lease. The deposits of the other bidders will be returned upon acceptance of the successful bids by the Secretary of the Interior. The successful bidder will be required to agree not to discriminate against any employee or applicant for employment because of race, creed, color, or national origin, and to require an identical provision to be included in all subcontracts. Bidders are warned against violation of section 59, U. S. Criminal Code, approved March 4, 1909, prohibiting unlawful combination or intimidation of bidders. The right is reserved to reject any and all bids in the discretion of the Secretary of the Interior. Fred W. Johnson, Commissioner.

In North Louisiana, two deep wildcats were being watched but on last reports they were still drilling ahead. In Bossier Parish, Barnsdall Oil Co.'s 1 Carter-Burton Unit, 26-23n-13w, was believed to be in the lower section of the Cotton Valley at 11,057 ft. In the Zwolle area of Sabine Parish, Union Producing Co.'s 1 Long Leaf was drilling at 12,215 ft.

Stanolind Oil & Gas Co. was reported to have a 6 months' geophysical option on 19,000 acres in Townships 16 and 17 north, Ranges 1 east and 1 west, near Eros, in Jackson and Ouachita parishes, and has agreed to drill a Travis Peak test.

SOUTH ARKANSAS WILDCAT FAILURE

Ouachita County: Joe Mucher et al 1 Berg Est., NW SE NE 12-14s-18w, dry, TD 2,600 ft.

NORTH LOUISIANA WILDCAT FAILURE

Franklin County: Sohio Petroleum Co. 1 L. Rogers Unit, SW NE 15-16n-9e, dry, TD 4,688 ft.

OKLAHOMA

South McClain County Has New Gas-Distillate Reservoir

THE Big Chief Drilling Co. 1 Stephens, SE SW 24-5n-2w, southwest of Wayne in McClain County, is drilling ahead for the Bromide zone after indicating on two drill-stem tests that it has tapped a new gas-distillate reservoir. Soft Pennsylvanian lime was encountered at 6,520-38 ft., soft sand at 6,538-41 ft., and hard sand at 6,541-43 ft. A soft streak which was drilled at the rate of 2 to 3 minutes per foot was found at 6,543-53 ft.

On a drill-stem test at 6,528-53 ft., there was a blow of gas and the packer failed in 2 minutes after a recovery of several hundred feet of mud. On a second drill-stem test at 6,534-53 ft. with a ½-in. bottom hole choke and 125 lb. back pressure, the well made an estimated 4,000,000 cu. ft. of wet gas in 20 minutes; the tester recovered 60 ft. of straw-colored distillate. There was no salt water. Crew is now drilling below 6,587 ft.

The Antioch region of Garvin County, which has been considered one of the more promising new oil areas of Oklahoma, received its second disappointment this week when British-American Oil Co. decided to give up at the 1 Guthrie, NW NW SE 7-3n-2w. An electric log was run to 7,452 ft. without indicating any possible saturation except a slight show of gas in the dolomite at 6,504-12½ ft. Previously, Mid-Continent Petroleum Corp. had ordered work suspended at its 1 Menefee, SE SE SE 2-4n-2w, northeast of Maysville. It topped the Bromide at 6,345 ft. and was bottomed at 6,407 ft. with no shows.

Wilcox Oil Co. has opened production in the Hunton zone with a 14,000,000 cu. ft. gas well offsetting its recent discovery about 1½ miles north of the North Okemah pool of Okfuskee County. The new strike is the 1 Callahan, SE SE NE 24-12n-9e, producing from the Hunton at 3,668-96 ft., total depth, following an acid treatment. Rock pressure was recorded as 1,400 lb. The discovery well of the area, 1 Lewis, SE NE NE 24-12n-9e, had an initial potential of 2,800,000 cu. ft. of gas from the Wapanucka-Cromwell zone at 3,180-96 ft. A comparable show was also encountered in the Cromwell zone in the 1 Callahan, but it was bypassed.

OKLAHOMA WILDCAT FAILURES

Cotton County: S. D. Johnson 1 A. E. Cain, NW NW NE 10-3s-11w, dry, TD 2,003 ft., sand 1,670-86 ft.

Johnson & Fletcher Drilling Co. 1 McCollough, NW SE NW 17-4s-13w, dry, TD 5,005 ft., sand 2,625-50 ft.

Creek County: Bay Petroleum Co. 1-A Bryan, SE NW SW 11-14n-8e, dry, TD 3,945 ft., dolomite 3,428 ft.

Lincoln County: N. V. Duncan 1 Reid, SE SW NW 10-16n-2e, dry, TD 5,046 ft., second Wilcox 5,021 ft.

Okfuskee County: W. R. Curry 1 Jones, NE SE SW 6-12n-10e, dry, TD 3,807 ft.

Pottawatomie County: James Wise et al 1 McNeely, NE NW SE 8-10n-5e, dry, TD 4,770 ft., Simpson dolomite 4,720 ft.

Seminole County: P. McIntyre, Sherman et al 1 B. Aldridge, SW NW SW 14-9n-7e, dry, TD 3,452 ft., Cromwell 3,428 ft.

OKLAHOMA SUCCESSFUL WILDCATS

Hughes County: Mid-Continent Petroleum Corp. 1 L. Rogers, NE SE SW 26-9n-8e, flowed 26 bbl. oil, sandy dolomite 4,390 ft., TD 4,456 ft.

Oklahoma County: Gulf Oil Corp. 1 C. W. Moyer, NE SE NE 15-14n-2w, flowed 16½ bbl. oil, Wilcox 6,098-6,110 ft., TD 6,169 ft.

MISSISSIPPI

Adams County Gasser Increases Flow in Paluxy

JACKSON.—The California Co.'s 9 Ella G. Lees, new gas well in the Cranfield field, Adams County, was still attracting interest last week. After showing dry gas from the lower Paluxy sand on a drill-stem test, the well was reperforated at 11,772-90 ft., 2½-in. tubing was run with packer set at 11,750 ft. and tests made with various size chokes.

Through ½-in. and ⅜-in. chokes, it flowed at the rate of 11,000,000 cu. ft. at 2,750 lb. pressure, and 9,200,000 cu. ft. daily, at 3,000 lb. flowing pressure.

Tubing was then pulled and an additional 4 ft. of sand perforated between 11,772-90 ft. When tested, the well showed an increase of flow to 13,400,000 cu. ft. at 2,760 lb. on ½-in. choke, and 10,000,000 cu. ft. of gas through ⅜-in. choke.

Other possible gas zones in the Paluxy at 11,576-11,600 ft. were indicated by electric log.

MISSISSIPPI WILDCAT FAILURES

Adams County: Humble Oil & Refining Co. 1 Adams City Board of Supervisors, NW SE SW 47-6n-1w, dry, TD 10,309 ft., no tops reported.

Clarke County: Sun Oil Co. 2 Long Bell Petroleum Co., NW SE 17-2n-17e, dry, TD 5,563 ft., Tuscaloosa 4,005 ft., Marine Tuscaloosa 4,767 ft., Davis sand 4,900 ft., Massive sand 5,000 ft.

Yalobusha County: J. S. Henderson 1 Stone, NE SW 21-24n-6e, dry, TD 3,212 ft., no tops reported.

FLORIDA WILDCAT FAILURE

Hernando County: Ohio Oil Co. 1 Hernasco Corp., NE NW NW 19-23s-18e, dry, TD 8,472 ft., in hard sand, Cretaceous 3,340 ft., hard sand and lime 5,549 ft.

Hearing on New Line Set For August 1

WASHINGTON.—A Federal Power Commission hearing has been set for August 1, in Washington, on the application of Washington Gas Light Co. for authorization to construct and operate a 16-in. pipe line to supply gas to Rosslyn Gas Co. for resale in Arlington and Fairfax counties and Alexandria, Virginia.

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Drilling Contractors

Rine Drilling Co. will drill the Sohio Petroleum Corp. and Rine Drilling Co. 1 Riseley in SW SW SW 2-17-19w, Rooks County, Kansas. Test will be supported by Gulf Oil Corp. It is based on core-drill information.

C. H. Holland, Princeton, Ind., will drill the Kirk D. Holland 1 Sallie Cunningham, in SE SE 117-1n-10w, Gibson County, Indiana.

Jones, Shelburne & Farmer, Inc., of Oklahoma City, will drill the Sohio Petroleum Corp. 1 Schneweis, in SW SW NE 31-17-11w, Barton County, Kansas. The test is 2 miles west of the town of Claflin and nearest production is the Kraft-Prusa pool 2 miles to the northeast. Black-Marshall Oil Co. is contributing.

Loffland Brothers Co. has drilling contract on the California Co. 1 Spears, in Section 13-L51, Lincoln County, Kentucky. The test is scheduled to be drilled to the granite, probably 8,000 to 10,000 ft. There are two shallow pools in Lincoln County, but no deep tests, according to available information.

Jackson Drilling Corp. is the contractor on the W. C. McBride, Inc., 1 Lochner, in SW SE SE 7-15n-4e, Lincoln County, Oklahoma. Rotary rig is being moved in for a Prue sand test 5 miles northwest of Chandler, on a block assembled by R. H. Lynn.

Creighton Drilling Co., drilling the Danciger Oil & Refining Co. 1 Pantlik, wildcat in NW NE SW 15-12n-5e, Lincoln County, Oklahoma, was drilling below 2,100 ft. Test is south of the Wilzetta production.

Ferrell & Hood are drilling contractors on the J. E. Hood 1 Raymond Taylor, in NE SW SE 20-1n-16w, Allegan County, Michigan.

Goodpasture Drilling Co. will drill on contract the E. M. Swearer 1 Hoskins, in SW SW SW 34-9-16w, Rooks County, Kansas. Location is in the southeastern part of the county, and is ¾ mile west of an abandoned producer and 1 mile northwest of the Erway pool production. Test is based on subsurface geology. Goodpasture recently completed the E. M. Swearer 1 Bice, in NW NW SW 10-10-17w, Rooks County, Kansas, as a dry hole. Test went to 3,520 ft.

Bennett & Roberts Drilling Co. are drilling the Vickers Petroleum Co. and Bennett & Roberts Drilling Co. 1 Bozart, in NE NE NW 3-16-1e, Dickinson County, Kansas. Tools were below 2,350 ft. on the test which is ½ mile northwest of the town of Carlton.

American Drilling Co. has been awarded drilling contract on the American Drilling Co. and Michigan Oil Co. 1 Alger Durham et al, in SW SW NW 19-19n-5e, Arenac County, Michigan.

J. E. Jolly, Princeton, Ind., will drill the Elden Hayden 2 Ed Creseius in SW SW 5-2s-10w, Gibson County, Indiana.

John Halko holds contract on the James Wise 1 State, in NE NE NW 16-10n-5e, Pottawatomie County, Oklahoma, south of the North Earlsboro pool.

Bye Drilling Co. has the contract on the Marion Oil Co. 1 Worden, in SE SE SW 20-30-2e, Sumner County, Kansas. Surface pipe was set at 98 ft. and test was drilling below

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300 ft. Location is 4 miles southeast of production in the recently discovered Bellman pool.

Veedor Supply Co. drilled the J. W. Fawcett et al 1 McBride, in NW SW SE 31-19-2w, McPherson County, Kansas, which was completed as a dry hole. This wildcat was drilled to a total depth of 3,040 ft. with the top of the Mississippi at 3,029 ft. and the top of the Kansas City lime at 2,372 ft.

Sam Viersen is contractor on the Wise & Douglas 1 Dudgeon, in NE NE NE 11-12n-10e, Okfuskee County, Oklahoma, which was drilling below 2,100 ft. Test is east of the Morse pool.

L. L. Peters, Tyler, Tex., has the contract for Humble Oil & Refining Co. 1 Lon Hale, Travis Peak wildcat in the J. S. Able Survey, 1 mile north of Kemp, Kaufman County, Texas.

C. J. Davidson, Fort Worth, Tex., has the contract to 4,500 ft. for Brasted, Hyer & Dedberg 1 Henderson, Section 6, Block 43, T-3-S, T&P Survey, wildcat 4 miles south of the east side of the Harper pool, Ector County, Texas.

Merrill Drilling Co. will drill two tests in Michigan for J. V. Wicklund Development Co. These are the A-4 State of Michigan Deep River in NE SW SE 6-19n-4e, Arenac County, and the 1 Blanche E. Brown, in SE SW NW 19-14n-5w, Isabella County.

Sam Malis, Mount Carmel, Ill., will drill the W. A. Brennan et al 1 John M. Brevoort, in NE NW 27-2n-11w, Knox County, Indiana.

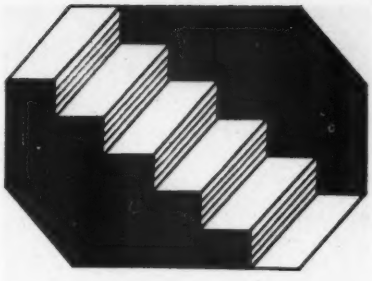
Fred Summers is the contractor on the Guy R. Rogers and Jimmie Rogers 1 P. S. Stone, in NW SW SW 3-8n-7e, Seminole County, Oklahoma.

T. T. Eason has drilling contract on the British-American Oil Producing Co. et al 1 Terhune, in SW SE NW 17-18n-4w, Logan County, Oklahoma, which was drilling near 2,000 ft.

Big Chief Drilling Co. holds contract on the Maner Graham 1 Carpenter-Craft, in SE NE SE 25-13n-7w, wildcat north of Rolling Fork, in Sharkey County, Mississippi. The test has spudded.

Drilling Contractors To Meet in October

The sixth annual meeting of the American Association of Oilwell Drilling Contractors will be held at San Antonio, October 1 and 2. Headquarters will be at the Plaza Hotel.



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PERSONALS

Ring Identified With Production Work Since 1915

D. T. RING, Columbus, Ohio, newly elected president of the Pennsylvania Grade Crude Oil Association, has been identified with oil and gas producing operations since 1915. Since March 1939, he has been vice president in charge of oil production for Preston Oil Co. of Ohio, Union Gasoline & Oil Corp. of Pennsylvania and West Virginia, and Virginian Gasoline & Oil Co. of Kentucky and West Virginia.

Previously, from 1915 to 1925, he was associated with Humphries Oil and F. Julius Fohs in the Mid-Continent and Gulf Coast areas, and from 1927 to 1939 with Ohio Fuel Gas Co.

Ring has been a director of the Pennsylvania Grade Crude Oil Association for 7 years and its second vice president for 5 years. He is a member of the general production committee of the American Petroleum Institute, chairman of its central committee district activities, and past chairman of the A.P.I. eastern district.

He is vice president for Ohio of the Independent Petroleum Association of America and member of the advisory and research committee on oil for Ohio and Ohio State University. He served on the Petroleum Industry Committee for District 1, Petroleum Administration for War, and is a member of the Office of Price Administration committee on subsidy payments for Ohio.

Holbrook G. Botset, formerly with Gulf Research & Development Co., has been appointed professor of petroleum engineering in the department of oil and gas production of the University of Pittsburgh. Botset, a graduate of Purdue University, has since 1928 been engaged in research in reservoir engineering with the Gulf organization.

M. L. Mayfield and **L. I. Mistrot,** petroleum engineers of Houston, have organized Production Engineers Service specializing in reservoir studies, core analyses, evaluation and production management.

John A. Walstrom, assistant sales manager, Asiatic Petroleum Corp., in New York City, has been awarded the Legion of Merit "for exceptionally meritorious conduct in the performance of outstanding services to the Government of the United States as officer-in-charge of Navy and lend-lease petroleum requirements." Walstrom was a Navy commander in charge of the theater requirements and supply division, Army-Navy Petroleum Board.

A. M. HOWSLEY

Andrew M. Howsley, Albany, Tex., attorney and independent operator in the stripper well area of West Central Texas, has been named general counsel for the Texas Mid-Continent Oil and Gas Association. Howsley, long active in the association, also will supervise the association's office in Dallas. The association will continue to carry on and expand its research and other services for Texas operators, said **Fred W. Shield,** president.

H. Chandler Ide is leaving government service this week after having served as special assistant to **Ralph K. Davies** since the spring of 1941 in the Office of Petroleum Coordinator, Petroleum Administration for War, and the Oil and Gas Division. He was also special assistant to Davies before the war in the Standard Oil Co. of California. Ide said he has no immediate plans except to take a long vacation in California, but he retains a position as a special consultant to the Oil and Gas Division and he might return to Washington for a temporary period of active duty in the fall.

E. E. Branch, Asiatic Petroleum Corp. official, is back in New York City following an extended business trip to Central and South America.

P. T. Lamont, chief of central European division, Standard Oil Co. (New Jersey) is in the United States on a business trip from his headquarters in Switzerland.

Virden W. Wilson, who has been connected with the refining department of The Texas Co. in New York, is now senior technologist of Shell Chemical Corp. with headquarters in Houston.

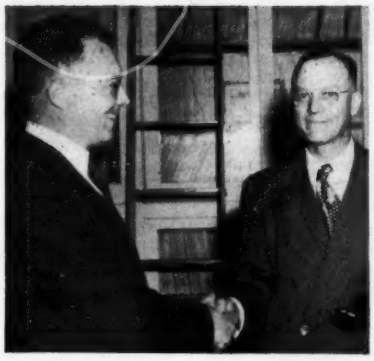
Louis C. Vogelsang, San Antonio, was elected general manager of Rio Grande Valley Gas Co. by the directors last week in New York. He succeeds Joseph C. Jordan who is retiring. Vogelsang was with San Antonio Public Service Co. before the war and later served as a colonel in the corps of engineers.

Arthur S. Davenport, Tulsa, has been appointed assistant to the secretary of the Interstate Oil Compact Commission and will handle the compact's information services and publications and serve as legal assistant. He was formerly a major in the Army Air Forces and is a member of the Oklahoma bar.

J. H. MacGaregill, vice president and director of Standard Oil Co. of California, left the United States recently for a business trip to Europe.

H. S. McCRAY

Howard S. McCray, superintendent of the Amarillo, Tex., refinery of The Texas Co., has been promoted to superintendent of the Lawrenceville, Ill., refinery of the company. McCray began his career with The Texas Co. as an engineer at the company's Port Arthur, Tex., refinery. McCray is being succeeded by **S. W. Johnson,** who has been assistant superintendent of The Texas Co.'s Houston refinery. Johnson will be succeeded by **Leonard Lee,** who was plant engineer at Amarillo.



Herschel Y. Hyde, right, new vice president of manufacturing for Tide Water Associated Oil Co., recently was presented a gold pen and pencil set by members of the company's research and development department which he headed for many years. The presentation was made at Avon, Calif., by C. K. Viland, who has been named to succeed Hyde as general supervisor of research and development. Hyde, a graduate of University of California and Massachusetts Institute of Technology, succeeds Lloyd F. Bayer, who during the war served as both vice president of manufacturing and chairman of the operating committee. Bayer will continue in the latter capacity.

Gordon H. Michler, chief of southern European division, Standard Oil Co. (New Jersey) left New York the middle of June, for a business trip to Europe.

S. Russel Casey, Jr., recently released Army captain, has joined Woodley Petroleum Co. of Houston as district geologist in the Texas Gulf area.

Arthur J. Harvey, president of Tex Harvey Oil Co., has announced transfer of the company's headquarters from Dallas to Palestine, Tex.

F. Julius Fohs, founder and former president of Fohs Oil Co., will open an office in Houston as a consulting geologist specializing in oil and gas exploration. Fohs recently sold his interest in Fohs Oil to Texas Gulf Producing Co. Now at his summer home in New Milford, Conn., Fohs announced his plans to return to Houston about October 1.

C. M. Foster, superintendent of production for Gulf Oil Corp., in the Wichita Falls, Tex., district, has been transferred to the West Texas division with headquarters at McElroy. Foster has been succeeded by H. F. Fortenberry, of McElroy, as superintendent of the Wichita Falls district.

W. H. Pinckard, board chairman and director of California Texas Oil Co., Ltd., is in Europe on an extended business trip.

Charles A. Foster, formerly with Shell Oil Co., Inc., in the United States before his military activities during the war, has joined the staff of Shell-Mex Argentina Co., Ltd.

Marsh S. Watson, Jr., formerly with Continental Oil Co. and now with The Texas Co., has been transferred to South America as petroleum engineer.

James A. Simons, geologist for Carter Oil Co. at Jackson, Miss., will leave this month for Caracas, Venezuela, to join the Standard Oil Co. (N. J.) organization there.

C. M. GILE

Clement M. Gile has been elected vice president of Gulf Oil Corp. and the Gulf Refining Co. and vice president and a director of Gulf Research & Development Co., succeeding **W. V. Hartmann,** retired. Gile will be in charge of marketing. He entered the oil business with New England Oil Co. in 1920 and joined the Gulf companies in 1926, as assistant to the general manager of sales.

Etienne L. Dalemont, director of the New York agency of Groupement D'Achat des Carburants (the French Petroleum Agency), left New York June 26 for a 3-weeks' trip to Paris. Dalemont was associated with Societe Anonyme des Petroles Jupiter (Shell) before the war.

G. E. Wheeler, works manager of the Abadan refinery of Anglo-Iranian Oil Co., Ltd., is being transferred to the London headquarters of the company. He is being succeeded by **K. B. Ross,** who has been deputy works manager. Ross recently spent several weeks visiting oil operations throughout the United States and has returned to Abadan to take over his new duties.

E. S. Robb, former chief engineer at the Houston refinery of Shell Oil Co., Inc., has been transferred to the engineering department of Shell Chemical Corp. at San Francisco. Robb has been with Shell since 1926 and has spent some time at the East Chicago, Ind., and Wood River, Ill., refineries. **Bob Haldane,** recently returned from Army service as a major, succeeds Robb as chief engineer at Houston.

SHIFTS—

Frank Volger, superintendent, Sohio Pipe Line Co., Oklahoma City, to Monticello, Ky.

Murl B. Howard, chemist, Phillips Petroleum Co., Kansas City, Kans., to Borger, Tex.

Joseph H. McCoy, geologist, Sinclair Wyoming Oil Co., Jackson, Miss., to Casper, Wyo.

Glen F. Bish, superintendent, Ohio Oil Co., Grand Rapids, Mich., to Tulsa,

Charles F. Passel, geologist, Sohio Petroleum Co., Bloomington, Ind., to Mt. Vernon, Ill.

Leo F. Swick, geologist, Magnolia Petroleum Co., Mt. Vernon, Ill., to Wichita Falls, Tex.

R. D. Reber, superintendent, Ryford Oil Co., McLeansboro, Ill., to Wolco, Ill.

Ernesto R. Peters, Eng., YPF, London, England, to Argentine Government office, 80 Broad St., New York City.

O. F. Lee, producer, Bible Grove, Ill., to Crossville, Ill.

A. C. Dahl, engineer, Shell Oil Co., Inc., Maplewood, La., to Midland, Tex.

John J. Fleet, drilling contractor, San Antonio, Tex., to Ada, Okla.

W. F. Morgan, producer, San Antonio to Houston.

A. H. Ilfrey, engineer, Humble Oil & Refining Co., Lubbock, Tex., to Pampa, Tex.

E. Randolph Smith, engineer, Stanolind Oil & Gas Co., Greggton, Tex., to Seaboard Oil Co., Van Nuys, Calif.

Robert W. Grumble, engineer, Magnolia Petroleum Co., Dallas, to Wilmington, Del.

Joe McLaughlin, engineer, Magnolia Petroleum Co., Dallas, to Kermit, Tex.

H. B. Smith, superintendent, Crude Oil Drilling & Exploration Co., Brenham, Tex., to Hoyleton, Ill.

R. W. Jordan, engineer, Pan-American Refining Co., Galveston, Tex., to Saymer, Wis.

J. L. Hamilton, superintendent, Lone Star Producing Co., Murchison, Tex., to Tyler, Tex.

Marsh S. Watson, Jr., engineer, The Texas Co., Plainview, Tex., to Caracas, Venezuela.

L. E. Gray, Jr., engineer, Gulf Oil Co., Goldsmith, Tex., to Ranger, Tex.

Harry Wheeldon, engineer, Shamrock Oil & Gas Corp., Sunray, Tex., to Amarillo.

E. Allen, superintendent, Houston Oil Co. of Texas, Clodine, Tex., to Houston, Tex.

R. W. Blackburn, engineer, Continental Oil Co., Rio Grande City, Tex., to Walden, Colo.

C. B. Hutchins, engineer, Panhandle Eastern Pipe Line Co., Mt. Pleasant, Tex., to Ft. Smith, Ark.

J. G. Houser, chemist, Sinclair Refining Co., Ingleside, Tex., to Corpus Christi.

Equipment Men in the News

O-C-T Appoints New Sales Representatives

Oil Center Tool Co. has announced appointment to its sales department of Harold L. Brown and John H. Moran.

Brown has had 10 years' experience in Oklahoma and Texas fields as specialty

H. L. BROWN

J. H. MORAN

equipment salesman. Moran is a former secretary of the Mid-Continent Division of A.P.I.

Bury Compressor Co. Elects New President

Bury Compressor Co., Erie, Pa., announces election of B. C. O'Brien as president and general manager. Prior to joining Bury, he was associated for a number of years with the Roots-Connersville Blower Corp. where he was vice president and sales manager.

Schnitzler Heads Division Of Wheeling Concern

Announcement has been made of the appointment of Elwin H. Schnitzler as sales manager of the manufacturing division of Wheeling Machine Products Co., Wheeling. Prior to the war Schnitzler was associated with Sterling Oil and Quaker State refineries in a managerial capacity.

Kerotest Acquires Wiljack Valve

Kerotest Manufacturing Co., Pittsburgh, announces the acquisition of the Wiljack Co., South Pasadena, Calif., manufacturers of bar stock valves in carbon and stainless steel.

McDuff Joins Southwest Supply

HOMER McDUFF

Shep Miers, vice president of Southwest Supply Co., Pittsburgh, announces appointment of Homer McDuff as district manager of the territory embracing Arkansas, Louisiana, Mississippi, and Alabama. Offices have been opened in the Commercial National Bank Building, Shreveport.

McDuff was formerly general superintendent of drilling and production for Pure Oil Co. in the Fort Worth district, and general drilling superintendent for Standard Oil Co. of Venezuela, and superintendent of drilling and production for Southern Production Co.

Ideco West Coast Manager Appointed

Appointment of Fred C. Ripley, Jr., as manager of Oil Well and Export Sales, California Division of Ideco, has been announced. His headquarters will be at Torrance, Calif. According to G. W. Walton, vice president of machinery and export oil well sales, Ripley will be in charge of International Derrick & Equipment Co. direct sales of oil-well equipment on the Pacific Coast both for domestic and export markets.

Export Officials Discuss World Trade

Problems of world trade were discussed recently at Dayton Rubber Export Co.'s general offices by E. L. Hollowell, vice president and managing director; E. E. Schnellbacher, chief of special services and intelligence branch, International Trade Division,

E. L. Hollowell, E. E. Schnellbacher, and Harry Heider

U. S. Department of Commerce, and Harry Heider, export manager of the Standard Register Co., Dayton. Schnellbacher spoke at the Dayton Chamber of Commerce banquet marking Foreign Trade Week.

Waterman Rejoins Petreco

Maj. Logan C. Waterman has rejoined Petroleum Rectifying Co. after serving in the Army Air Forces for approximately 3½ years. Waterman spent 2 years overseas, in Australia, New Guinea, the Philippines, China and Japan. He will now be located in the Petreco Houston office, in an executive engineering capacity.

Bank Elects Officers

John K. Campbell has been elected a vice president of Republic National Bank of Dallas, Fred F. Florence, president, announced. Florence also announced the election of Robert E. Morgan and E. Leon Rogers as assistant cashier and of A. J. Mason as assistant trust officer.

New Consulting Service Formed

M. L. (Verne) Mayfield and L. I. (Bob) Mistrot, petroleum engineers of Houston, have organized Production Engineering

M. L. MAYFIELD

L. I. MISTROT

Service, specializing in complete field-reservoir studies, core analyses, evaluation, and production management.

For 12 years on the petroleum engineering staff of Arkansas Fuel Oil Co., Bob Mistrot has specialized in oil and gas-condensate reservoir studies, core analyses, and production-management problems.

More recently he was production manager and chief engineer of a large group of independent properties operated by C. J. Brown, in Texas and Louisiana.

Mayfield was on the petroleum engineering staff of Cities Service Oil Co., chief engineer for Cotton Valley Operators Committee, an official of Petroleum Administration for War, and technical advisor-engineer to the Petroleum Industry War Committee prior to entering the consulting field. The company's offices are in the Mellie Esperson Building.

Failing Opens Midland Store

Geo. E. Failing Supply Co., Enid, Okla., announces the opening of a new store in Midland, Tex. The Failing company purchased a building in Midland and has had it completely remodeled, inside and out, to fit its needs. Manager of the Midland store is Russell Cowheard, who has been with Failing for a number of years. Jimmy Helton is the field man for the store and Bert R. Fisher is in charge of service at the store.

Visser Joins Franks Manufacturing Corp.

Gerrit A. Visser, formerly executive in charge of the manufacturing engineering division of Manning, Maxwell & Moore, has been named vice president and works manager of Franks Manufacturing Corp. of Tulsa, according to Carl White, Jr., president. Visser was born and educated in the Netherlands, graduating from the University of Delft in Europe with an M.E. degree.

Republic Supply Opens Stores

Republic Supply Co., Houston, announces opening of new stores at Columbus, Tex., Mamou, La., and Cement, Okla., and has appointed J. J. Miller as new assistant district manager at Odessa, Tex. G. R. Holtz has been added to the sales force at Evansville, Ind.